# FCC TEST REPORT

**REPORT NO.:** RF930309H03
**MODEL NO.:** LA-5033
**RECEIVED:** Mar. 09, 2003
**TESTED:** Mar. 17 to 25, 2004

**APPLICANT:** SYMBOL TECHNOLOGIES, INC.

**ADDRESS:** HOLTSVILLE N.Y., 11742, USA

**ISSUED BY:** Advance Data Technology Corporation

**LAB LOCATION:** No. 81-1, Lu Liao Keng, 9 Ling, Wu Lung Tsuen,
Chiung Lin Hsiang, Hsin Chu Hsien,
Taiwan, R.O.C.

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0536

ILAC MRA

Lab Code: 200376-0

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# 1. CERTIFICATION

| | |
|---|---|
| **PRODUCT :** | Symbol Wireless Networker 802.11a/g PCI Adapter |
| **BRAND NAME :** | SYMBOL Technologies |
| **MODEL NO. :** | LA-5033 |
| **APPLICANT :** | SYMBOL TECHNOLOGIES, INC. |
| **STANDARDS :** | 47 CFR Part 15, Subpart C (Section 15.247), Subpart E (Section 15.407), ANSI C63.4-1992 |

We, **Advance Data Technology Corporation**, hereby certify that one sample (Model: LA-5033) of the designation has been tested in our facility from Mar. 17 to 25, 2004. The test record data evaluation and Equipment under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions herein specified.

**PREPARED BY:** Amanda Chu , **DATE:** *Mar. 30, 2004*

( Amanda Chu )

**APPROVED BY:** _____ , **DATE:** *Mar. 30, 2004*

( Eric Lin, Manager )

## 2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

| APPLIED STANDARD: 47 CFR Part 15, Subpart C | | | |
|---|---|---|---|
| **Standard Section** | **Test Type and Limit** | **Result** | **REMARK** |
| 15.207 | AC Power Conducted Emission | PASS | Meet the requirement of limit<br>Minimum passing margin is –20.85dBuV<br>at 1.744MHz |
| 15.247(a)(2) | Spectrum Bandwidth of a Direct Sequence Spread Spectrum System<br>Limit: min. 500kHz | PASS | Meet the requirement of limit |
| 15.247(b) | Maximum Peak Output Power<br>Limit: max. 30dBm | PASS | Meet the requirement of limit |
| 15.247(c) | Radiated Emissions<br>Limit: Table 15.209 | PASS | Meet the requirement of limit<br>Minimum passing margin is –2.0dBuV at 2390.00MHz |
| 15.247(d) | Power Spectral Density<br>Limit: max. 8dBm | PASS | Meet the requirement of limit |
| 15.247(c) | Band Edge Measurement<br>Limit: 20dB less than the peak value of fundamental frequency | PASS | Meet the requirement of limit |

| APPLIED STANDARD: 47 CFR Part 15, Subpart E | | | |
|---|---|---|---|
| **Standard Section** | **Test Type** | **Result** | **REMARK** |
| 15.407(b)(5) | AC Power Conducted Emission | PASS | Meet the requirement of limit<br>Minimum passing margin is –19.38dBuV at 1.741MHz |
| 15.407(b/1/2/3)(b)(5) | Electric Field Strength Spurious Emissions,<br>30 MHz – 40000 MHz | PASS | Meet the requirement of limit<br>Minimum passing margin is –4.8dBuV at 11490.00MHz |
| 15.407(a/1/2/3) | Peak Transmit Power | PASS | Meet the requirement of limit |
| 15.407(a)(6) | Peak Power Excursion | PASS | Meet the requirement of limit |
| 15.407(a/1/2/3) | Peak Power Spectral Density | PASS | Meet the requirement of limit |
| 15.407(g) | Frequency Stability | PASS | Meet the requirement of limit |

# 3. GENERAL INFORMATION

## 3.1 GENERAL DESCRIPTION OF EUT

| | |
|---|---|
| **PRODUCT** | Symbol Wireless Networker 802.11a/g PCI Adapter |
| **MODEL NO.** | LA-5033 |
| **POWER SUPPLY** | 5VDC from host equipment |
| **MODULATION** | DSSS, OFDM |
| **TRANSFER RATE** | 802.11b and draft 802.11g:<br>1/2/5.5/6/9/11/12/18/24/36/48/54Mbps<br>802.11a:6 to 54Mbps |
| **FREQUENCY RANGE** | 802.11b and draft 802.11g: 2412MHz ~ 2472MHz<br>802.11a: 5.15~5.35GHz and 5.725~5.825GHz |
| **NUMBER OF CHANNEL** | 802.11b and draft 802.11g: 11<br>802.11a: 12 for Normal mode |
| **CHANNEL SPACING** | 802.11b and draft 802.11g: 5MHz<br>802.11a: 20MHz for Normal mode |
| **OUTPUT POWER** | 802.11b: 17.79dBm / draft 802.11g: 14.63dBm<br>802.11a: 21.48dBm |
| **DATA CABLE** | NA |
| **ANTENNA TYPE** | Integral Dipole antenna with 5ft cable |
| **I/O PORTS** | NA |
| **ASSOCIATED DEVICES** | NA |

**NOTE**:

1. Dual-band, the EUT communicates with Wireless-A (802.11a), Wireless-B, (802.11b), and Wireless-G (draft 802.11g) wireless networks.

2. The antenna cable connector (MMCX) was fixed in a soldered shielded case that can not be removed by user

3. For more detailed features description, please refer to the manufacturer's specifications or User's Manual.

## 3.2 DESCRIPTION OF TEST MODES

For 802.11b: Eleven channels are provided to this EUT.

| Channel | Frequency | Channel | Frequency |
|---|---|---|---|
| 1 | 2412 MHz | 7 | 2442 MHz |
| 2 | 2417 MHz | 8 | 2447 MHz |
| 3 | 2422 MHz | 9 | 2452 MHz |
| 4 | 2427 MHz | 10 | 2457 MHz |
| 5 | 2432 MHz | 11 | 2462 MHz |
| 6 | 2437 MHz | | |

**NOTE:**

1. Below 1 GHz, the channel 1, 6, and 11 were pre-tested in chamber. The channel 11, worst case one, was chosen for final test.
2. Above 1 GHz, the channel 1, 6, and 11 were tested individually.
3. Transfer rate, 11Mbps with CCK technique and 6Mbps with OFDM technique, the worst case, were chosen for final test.
4. Test result A is for CCK technique and test result B is for OFDM technique which presented in Section 4.

For 802.11a: Twelve channels are provided to this EUT for Normal mode.

| Channel | Frequency | Channel | Frequency |
|---|---|---|---|
| 1 | 5180 MHz | 7 | 5300 MHz |
| 2 | 5200 MHz | 8 | 5320 MHz |
| 3 | 5220 MHz | 9 | 5745MHz |
| 4 | 5240 MHz | 10 | 5765MHz |
| 5 | 5260 MHz | 11 | 5785MHz |
| 6 | 5280 MHz | 12 | 5805MHz |

**NOTE:**

1. The EUT was tested in normal mode (channel bandwidth of approximately 20 MHz).
2. “Normal Mode” allows data rates of up to 54Mbps. The device was, therefore, tested in Normal mode at the data rate that produced the highest output power for normal mode (6Mbps).
3. Channel 1, 4, 5, 8, 9 and 12 are the closest frequencies to the band edge, were chosen for final test of Normal Mode.

## 3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a Symbol Wireless Networker 802.11a/g PCI Adapter According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

**47 CFR Part 15, Subpart C. (15.247),**
**Subpart E (15.407). ANSI C63.4 : 1992**

All tests have been performed and recorded as per the above standards.

**NOTE**: The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of 47CFR Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

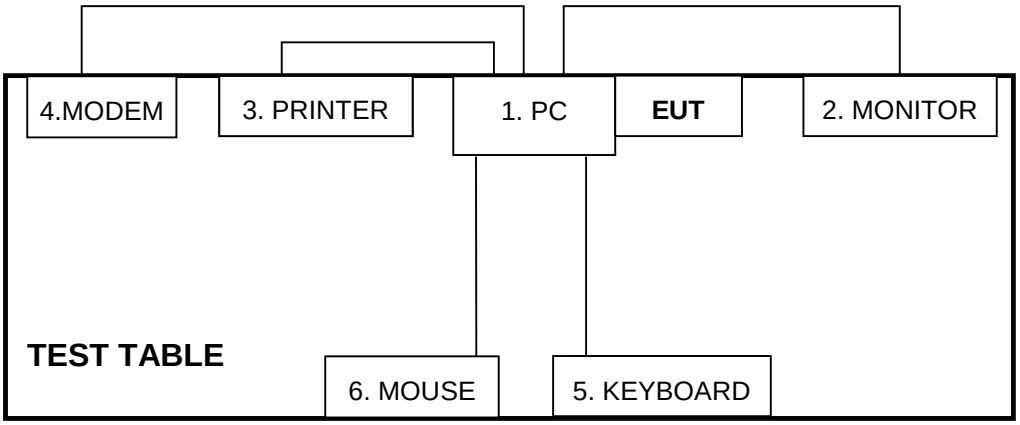
## 3.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| No. | Product | Brand | Model No. | Serial No. | FCC ID |
|---|---|---|---|---|---|
| 1 | Personal Computer | DELL | 4600 | 00043-517-542-482 | FCC DoC |
| 2 | LCD MONITOR | ADI | CM100 | 026058T10200528 | FCC DoC |
| 3 | PRINTER | HP | C2642A | MY7961C1FQ | B94C2642X |
| 4 | MODEM | ACEEX | 1414 | 0206026773 | IFAXDM1414 |
| 5 | KEYBOARD | BTC | KB-5200T | F24800403 | E5XKB5122WTH0110 |
| 6 | MOUSE | BTC | M851 | G00347024430 | NA |

| No. | Signal cable description |
|---|---|
| 1 | NA |
| 2 | 1.8 m braid shielded wire, terminated with VGA connector via metallic frame, w/o core. |
| 3 | 1.8 m foil shielded wire, terminal by frame, PS2 Connector, w/o Core. |
| 4 | 1.0 m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame, w/o core |
| 5 | 1.8 m foil shielded wire, terminal by frame, PS2 Connector, w/o Core. |
| 6 | 1.8 m foil shielded wire, terminal by frame, PS2 Connector, w/o Core. |

Note: 1. All power cords of the above support units are unshielded (1.8m).




**NOTE:** 1. Please refer to the photos of test configuration in Item 5 also.

# 4. TEST TYPES AND RESULTS (FOR PART 802.11b)

## 4.1 CONDUCTED EMISSION MEASUREMENT

### 4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

| FREQUENCY OF EMISSION (MHz) | CONDUCTED LIMIT (dBμV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15-0.5 | 66 to 56 | 56 to 46 |
| 0.5-5 | 56 | 46 |
| 5-30 | 60 | 50 |

**NOTE**:
1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.
3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

### 4.1.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED UNTIL |
|---|---|---|---|
| ROHDE & SCHWARZ Test Receiver | ESCS 30 | 847124/029 | Dec. 04, 2004 |
| ROHDE & SCHWARZ LISN (for EUT) | ESHS-Z5 | 848773/004 | Nov. 04, 2004 |
| KYORITSU LISN (for peripheral) | KNW-407 | 8/1395/12 | Jul. 27, 2004 |
| RF Cable (JETBAO) | RG233/U | Cable_CA_01 | Jul. 03, 2004 |
| Terminator(for KYORITSU) | 50 | 3 | Apr. 11, 2004 |
| Software | Cond-V2e | NA | NA |

NOTE:
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in ADT Shielded Room No. A.
3. The VCCI Con A Registration No. is C-817.

### 4.1.3 TEST PROCEDURES

a. The EUT/HOST was placed 0.4 meters from the conducting wall of the shielded room with EUT/HOST being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.

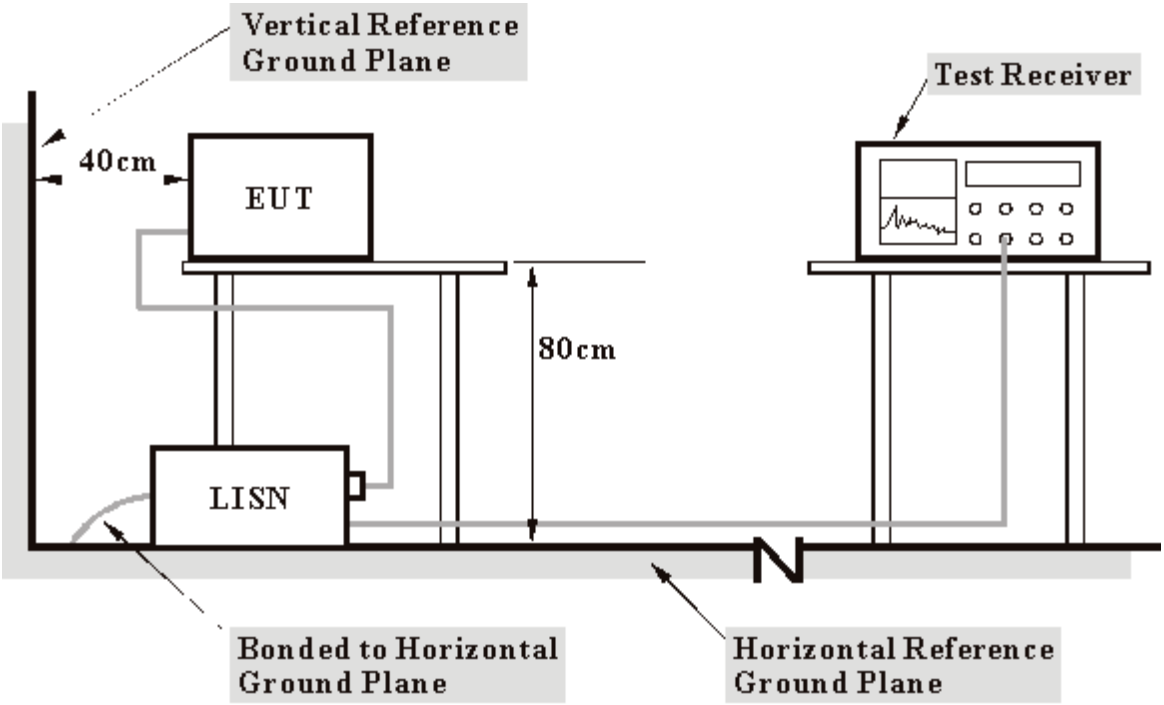
b. Both lines of the power mains connected to the EUT/HOST were checked for maximum conducted interference.

c. The frequency range from 150 kHz to 30 MHz was searched. Emission levels over 10dB under the prescribed limits could not be reported

### 4.1.4 DEVIATION FROM TEST STANDARD

No deviation

### 4.1.5 TEST SETUP




Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

### 4.1.6 EUT OPERATING CONDITIONS

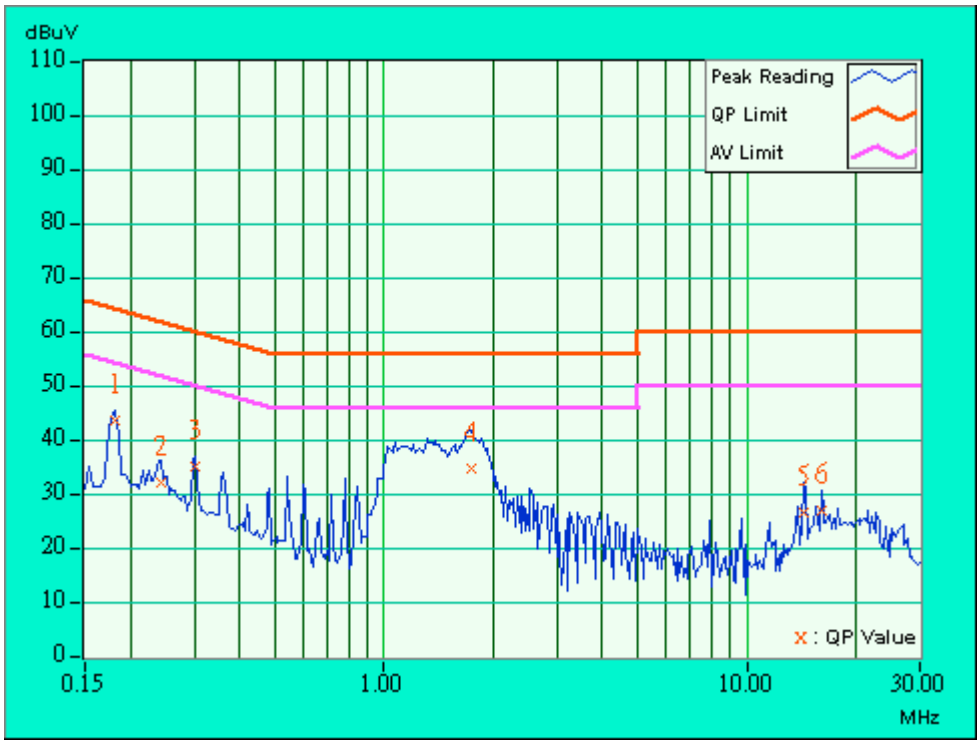
a. Install the EUT into support unit 1 (PC) which placed on a testing table.
b. The support unit 1 (PC) ran a test program to enable EUT under transmission condition continuously at specific channel frequency.
c. PC sends "H" messages to modem.
d. PC sends "H" messages to printer, and the printer prints them on paper.

## 4.1.7 TEST RESULTS

| | | | |
|---|---|---|---|
| **EUT** | Symbol Wireless Networker 802.11a/g PCI Adapter | | |
| **MODEL** | LA-5033 | | |
| **MODE** | Channel 11 | **6dB BANDWIDTH** | 9 kHz |
| **INPUT POWER (SYSTEM)** | 120Vac, 60Hz | **PHASE** | Line (L) |
| **ENVIRONMENTAL CONDITIONS** | 24deg. C, 58%RH, 980 hPa | **TESTED BY** | Eric Lee |

| No | Freq. | Corr. Factor | Reading Value [dB (uV)] | | Emission Level [dB (uV)] | | Limit [dB (uV)] | | Margin (dB) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | [MHz] | (dB) | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 1 | 0.181 | 0.20 | 42.54 | - | 42.74 | - | 64.43 | 54.43 | -21.69 | - |
| 2 | 0.244 | 0.20 | 31.09 | - | 31.29 | - | 61.97 | 51.97 | -30.68 | - |
| 3 | 0.302 | 0.20 | 34.00 | - | 34.20 | - | 60.18 | 50.18 | -25.98 | - |
| 4 | 1.740 | 0.30 | 33.82 | - | 34.12 | - | 56.00 | 46.00 | -21.88 | - |
| 5 | 14.336 | 1.06 | 25.53 | - | 26.59 | - | 60.00 | 50.00 | -33.41 | - |
| 6 | 16.094 | 1.10 | 25.97 | - | 27.07 | - | 60.00 | 50.00 | -32.93 | - |

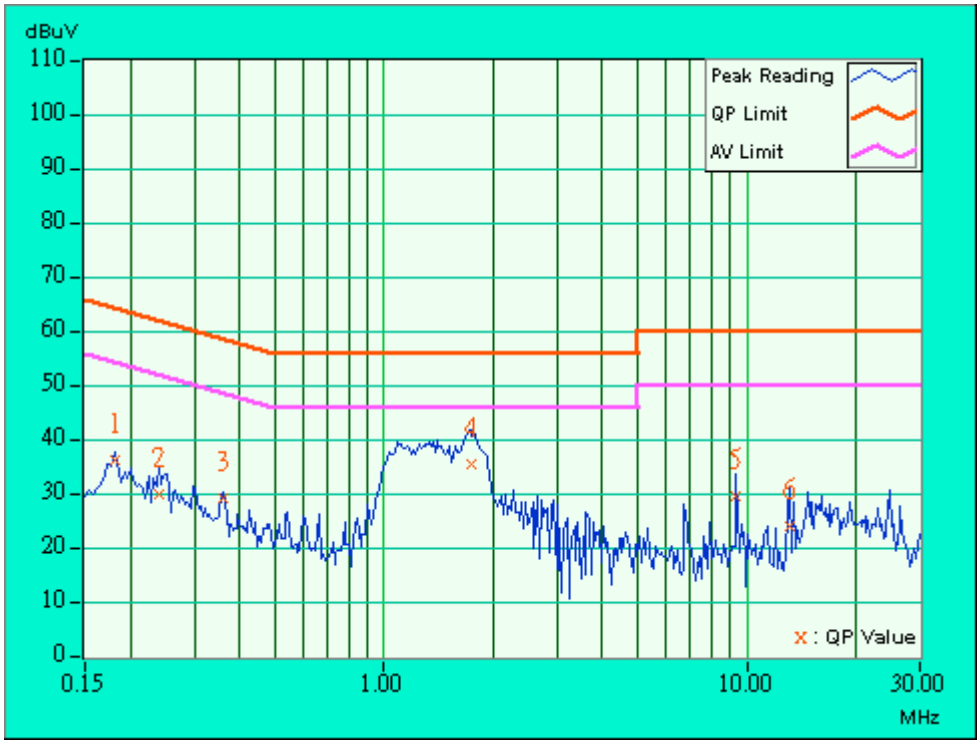
NOTES: (1) "*": Undetectable
(2) Q.P. and AV. are abbreviations of quasi-peak and average.
(3) "-": The Quasi-peak reading value also meets an average limit, thus measurement with the average detector is unnecessary.
(4) The emission levels of other frequencies were very low against the limit.
(5) Correction Factor = Insertion loss + Cable loss
(6) Margin value = Emission level - Limit value



| | | | |
|---|---|---|---|
| **EUT** | Symbol Wireless Networker 802.11a/g PCI Adapter | | |
| **MODEL** | LA-5033 | | |
| **MODE** | Channel 11 | **6dB BANDWIDTH** | 9 kHz |
| **INPUT POWER (SYSTEM)** | 120Vac, 60Hz | **PHASE** | Neutral (N) |
| **ENVIRONMENTAL CONDITIONS** | 24deg. C, 58%RH, 980 hPa | **TESTED BY** | Eric Lee |

| No | Freq. | Corr. Factor | Reading Value [dB (uV)] | | Emission Level [dB (uV)] | | Limit [dB (uV)] | | Margin (dB) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | [MHz] | (dB) | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 1 | 0.181 | 0.20 | 35.48 | - | 35.68 | - | 64.43 | 54.43 | -28.75 | - |
| 2 | 0.240 | 0.20 | 29.20 | - | 29.40 | - | 62.10 | 52.10 | -32.70 | - |
| 3 | 0.361 | 0.20 | 28.53 | - | 28.73 | - | 58.71 | 48.71 | -29.98 | - |
| **4** | **1.744** | **0.30** | **34.85** | **-** | **35.15** | **-** | **56.00** | **46.00** | **-20.85** | **-** |
| 5 | 9.363 | 0.67 | 28.77 | - | 29.44 | - | 60.00 | 50.00 | -30.56 | - |
| 6 | 13.164 | 0.89 | 23.00 | - | 23.89 | - | 60.00 | 50.00 | -36.11 | - |

NOTES: (1) "*": Undetectable
(2) Q.P. and AV. are abbreviations of quasi-peak and average.
(3) "-": The Quasi-peak reading value also meets an average limit, thus measurement with the average detector is unnecessary.
(4) The emission levels of other frequencies were very low against the limit.
(5) Correction Factor = Insertion loss + Cable loss
(6) Margin value = Emission level - Limit value



## 4.2 RADIATED EMISSION MEASUREMENT

### 4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

| Frequencies (MHz) | Field strength (microvolts/meter) | Measurement distance (meters) |
|---|---|---|
| 0.009-0.490 | 2400/F(kHz) | 300 |
| 0.490-1.705 | 24000/F(kHz) | 30 |
| 1.705-30.0 | 30 | 30 |
| 30-88 | 100 | 3 |
| 88-216 | 150 | 3 |
| 216-960 | 200 | 3 |
| Above 960 | 500 | 3 |

**NOTE**:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

### 4.2.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED UNTIL |
|---|---|---|---|
| HP Spectrum Analyzer | 8590L | 3467U00646 | Jun. 29, 2004 |
| *ADVANTEST Spectrum Analyzer | R3271A | 85060311 | Jun. 16, 2004 |
| CHASE RF Pre_Amplifier | CPA9232 | 1056 | May 12, 2004 |
| *HP Pre_Amplifier | 8449B | 3008A01922 | Oct. 13, 2004 |
| *ROHDE & SCHWARZ Test Receiver | ESVS 30 | 841977/002 | Sep. 17, 2004 |
| *CHASE Broadband Antenna | CBL6112B | 2798 | Apr. 16, 2004 |
| *Schwarzbeck Horn_Antenna | BBHA9120-D1 | D123 | Sep. 24, 2004 |
| Schwarzbeck Horn_Antenna | BBHA 9170 | BBHA9170192 | Feb. 16, 2005 |
| SCHWARZBECK Tunable Dipole Antenna | UHAP | 897 | Mar. 07, 2005 |
| SCHWARZBECK Tunable Dipole Antenna | VHAP | 880 | Mar. 07, 2005 |
| *RF Switches | MP59B | 1-5161-28698 | Jul. 31, 2004 |
| *RF Cable(CHASE) | CH A9525 | Cable_OB_01 | Jul. 31, 2004 |
| *Software | AS60P8 | NA | NA |
| *CHANCE MOST Antenna Tower | AT-100 | CM-A007 | NA |
| *CHANCE MOST Turn Table | TC-008 | CM-T007 | NA |
| *CORCOM AC Filter | MRI2030 | 024/019 | NA |

Note: 1. The calibration interval of the above test instruments is 12 months (36 months for Tunable Dipole Antenna) and the calibrations are traceable to NML/ROC and NIST/USA.
2. * = These equipment are used for the final measurement.
3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The test was performed in ADT Open Site No. B.
5. The VCCI Site Registration No. is R-847.
6. The FCC Site Registration No. is 92753.
7. The CANADA Site Registration No. is IC 4824-2.

### 4.2.3 TEST PROCEDURES

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using the quasi-peak method or average method as specified and then reported in Data sheet peak mode and QP mode.

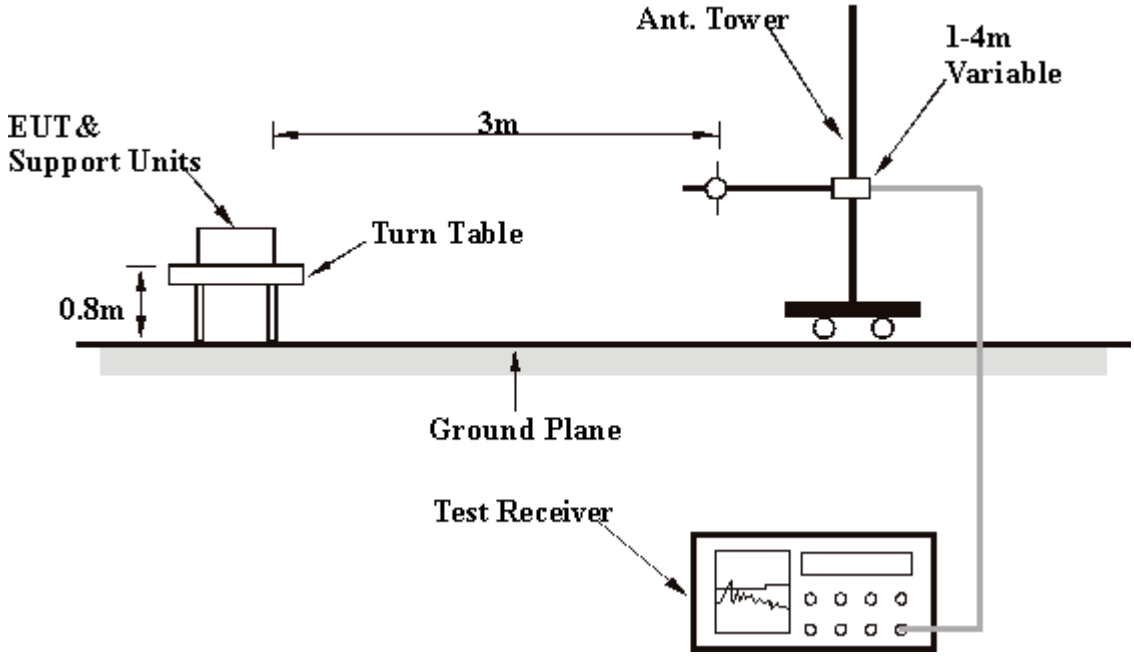
**NOTE:**

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 300 Hz for Average detection (AV) at frequency above 1GHz.

### 4.2.4 DEVIATION FROM TEST STANDARD

No deviation

### 4.2.5 TEST SETUP




For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

### 4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6

## 4.2.7 TEST RESULTS

| | | | |
|---|---|---|---|
| **EUT** | Symbol Wireless Networker 802.11a/g PCI Adapter | **MODEL** | LA-5033 |
| **MODE** | Channel 11 | **FREQUENCY RANGE** | 30~1000 MHz |
| **INPUT POWER (SYSTEM)** | 120Vac, 60Hz | **DETECTOR FUNCTION** | Quasi-Peak |
| **ENVIRONMENTAL CONDITIONS** | 24deg. C, 64%RH, 980 hPa | **TESTED BY** | Eric Lee |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | 166.38 | 36.10 QP | 43.50 | -7.40 | 1.73 H | 317 | 25.20 | 10.90 |
| 2 | 233.00 | 38.60 QP | 46.00 | -7.40 | 1.22 H | 207 | 27.00 | 11.60 |
| 3 | 299.50 | 32.00 QP | 46.00 | -14.00 | 1.10 H | 220 | 16.30 | 15.70 |
| 4 | 320.00 | 34.00 QP | 46.00 | -12.00 | 1.00 H | 207 | 17.70 | 16.30 |
| 5 | 400.00 | 33.50 QP | 46.00 | -12.50 | 1.00 H | 211 | 15.30 | 18.20 |
| 6 | 480.00 | 29.90 QP | 46.00 | -16.10 | 1.02 H | 209 | 9.30 | 20.60 |
| 7 | 720.08 | 34.40 QP | 46.00 | -11.60 | 1.32 H | 263 | 9.20 | 25.20 |
| 8 | 766.11 | 29.70 QP | 46.00 | -16.30 | 2.04 H | 4 | 2.90 | 26.80 |
| 9 | 768.09 | 38.20 QP | 46.00 | -7.80 | 1.21 H | 234 | 11.50 | 26.70 |
| 10 | 810.01 | 32.30 QP | 46.00 | -13.70 | 1.33 H | 235 | 5.80 | 26.50 |
| 11 | 864.10 | 38.10 QP | 46.00 | -7.90 | 1.22 H | 228 | 10.50 | 27.60 |
| 12 | 912.11 | 34.10 QP | 46.00 | -11.90 | 1.00 H | 78 | 6.30 | 27.80 |

| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | 166.37 | 31.20 QP | 43.50 | -12.30 | 1.10 V | 278 | 20.30 | 10.90 |
| 2 | 232.80 | 32.40 QP | 46.00 | -13.60 | 1.09 V | 241 | 20.80 | 11.60 |
| 3 | 280.00 | 25.20 QP | 46.00 | -20.80 | 1.08 V | 216 | 10.60 | 14.60 |
| 4 | 400.00 | 27.90 QP | 46.00 | -18.10 | 1.07 V | 352 | 9.70 | 18.20 |
| 5 | 480.00 | 28.90 QP | 46.00 | -17.10 | 1.04 V | 263 | 8.30 | 20.60 |
| 6 | 720.08 | 32.50 QP | 46.00 | -13.50 | 1.00 V | 289 | 7.30 | 25.20 |
| 7 | 768.09 | 37.00 QP | 46.00 | -9.00 | 1.03 V | 208 | 10.30 | 26.70 |
| 8 | 810.02 | 32.00 QP | 46.00 | -14.00 | 1.04 V | 212 | 5.50 | 26.50 |
| 9 | 864.10 | 35.40 QP | 46.00 | -10.60 | 1.09 V | 164 | 7.80 | 27.60 |
| 10 | 912.11 | 35.50 QP | 46.00 | -10.50 | 1.23 V | 20 | 7.70 | 27.80 |

**REMARKS**:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.

## TEST RESULTS (A)- DSSS

| | | | |
|---|---|---|---|
| **EUT** | Symbol Wireless Networker 802.11a/g PCI Adapter | **MODEL** | LA-5033 |
| **MODE** | Channel 1 | **FREQUENCY RANGE** | 1000MHz~25000MHz |
| **INPUT POWER (SYSTEM)** | 120Vac, 60Hz | **DETECTOR FUNCTION** | Peak(PK)<br>Average (AV) |
| **ENVIRONMENTAL CONDITIONS** | 24deg. C, 64%RH, 980 hPa | **TESTED BY** | Tony Chen |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | 2390.00 | 42.60 PK | 74.00 | -31.40 | 1.65 H | 38 | 12.80 | 29.80 |
| 2 | *2412.00 | 96.30 PK | | | 1.69 H | 41 | 66.40 | 29.90 |
| 2 | *2412.00 | 89.80 AV | | | 1.69 H | 41 | 59.90 | 29.90 |
| 3 | 4824.00 | 45.10 PK | 74.00 | -28.90 | 1.59 H | 72 | 8.90 | 36.20 |
| 4 | 7236.00 | 49.40 PK | 74.00 | -24.60 | 1.53 H | 61 | 7.70 | 41.70 |
| 5 | 9648.00 | 52.20 PK | 74.00 | -21.80 | 1.47 H | 51 | 7.30 | 44.90 |
| 5 | 9648.00 | 41.30 AV | 54.00 | -12.70 | 1.47 H | 51 | -3.60 | 44.90 |

| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | 2390.00 | 59.10 PK | 74.00 | -14.90 | 1.70 V | 53 | 29.30 | 29.80 |
| **1** | **2390.00** | **52.00 AV** | **54.00** | **-2.00** | **1.70 V** | **53** | **22.20** | **29.80** |
| 2 | *2412.00 | 112.70 PK | | | 1.69 V | 62 | 82.80 | 29.90 |
| 2 | *2412.00 | 105.70 AV | | | 1.69 V | 62 | 75.80 | 29.90 |
| 3 | 4824.00 | 44.10 PK | 74.00 | -29.90 | 1.53 V | 77 | 7.90 | 36.20 |
| 4 | 7236.00 | 49.10 PK | 74.00 | -24.90 | 1.43 V | 98 | 7.40 | 41.70 |
| 5 | 9648.00 | 52.10 PK | 74.00 | -21.90 | 1.47 V | 83 | 7.20 | 44.90 |
| 5 | 9648.00 | 40.60 AV | 54.00 | -13.40 | 1.47 V | 83 | -4.30 | 44.90 |

**REMARKS**:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The limit value is defined as per 15.247
6. “ * “ : Fundamental frequency

| | | | |
|---|---|---|---|
| **EUT** | Symbol Wireless Networker 802.11a/g PCI Adapter | **MODEL** | LA-5033 |
| **MODE** | Channel 6 | **FREQUENCY RANGE** | 1000MHz~25000MHz |
| **INPUT POWER (SYSTEM)** | 120Vac, 60Hz | **DETECTOR FUNCTION** | Peak(PK)<br>Average (AV) |
| **ENVIRONMENTAL CONDITIONS** | 24deg. C, 64%RH, 980 hPa | **TESTED BY** | Tony Chen |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | *2437.00 | 100.40 PK | | | 1.10 H | 146 | 70.40 | 30.00 |
| 1 | *2437.00 | 93.40 AV | | | 1.10 H | 146 | 63.40 | 30.00 |
| 2 | 4874.00 | 43.90 PK | 74.00 | -30.10 | 1.01 H | 328 | 7.50 | 36.50 |
| 3 | 7311.00 | 49.70 PK | 74.00 | -24.30 | 1.03 H | 228 | 8.00 | 41.80 |
| 4 | 9748.00 | 52.30 PK | 74.00 | -21.70 | 1.02 H | 0 | 7.70 | 44.60 |
| 4 | 9748.00 | 40.90 AV | 54.00 | -13.10 | 1.02 H | 0 | -3.70 | 44.60 |

| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | *2437.00 | 111.60 PK | | | 1.05 V | 136 | 81.60 | 30.00 |
| 1 | *2437.00 | 104.40 AV | | | 1.05 V | 136 | 74.40 | 30.00 |
| 2 | 4874.00 | 44.90 PK | 74.00 | -29.10 | 1.10 V | 109 | 8.40 | 36.50 |
| 3 | 7311.00 | 49.50 PK | 74.00 | -24.50 | 1.05 V | 338 | 7.80 | 41.80 |
| 4 | 9748.00 | 52.60 PK | 74.00 | -21.40 | 1.10 V | 128 | 7.90 | 44.60 |
| 4 | 9748.00 | 41.00 AV | 54.00 | -13.00 | 1.10 V | 128 | -3.60 | 44.60 |

**REMARKS**:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The limit value is defined as per 15.247
6. “ * “ : Fundamental frequency

| | | | |
|---|---|---|---|
| **EUT** | Symbol Wireless Networker 802.11a/g PCI Adapter | **MODEL** | LA-5033 |
| **MODE** | Channel 11 | **FREQUENCY RANGE** | 1000MHz~25000MHz |
| **INPUT POWER (SYSTEM)** | 120Vac, 60Hz | **DETECTOR FUNCTION** | Peak(PK)<br>Average (AV) |
| **ENVIRONMENTAL CONDITIONS** | 24deg. C, 64%RH, 980 hPa | **TESTED BY** | Tony Chen |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | *2462.00 | 97.90 PK | | | 1.00 H | 299 | 67.80 | 30.10 |
| 1 | *2462.00 | 90.70 AV | | | 1.00 H | 299 | 60.60 | 30.10 |
| 2 | 2483.50 | 44.30 PK | 74.00 | -29.70 | 1.04 H | 312 | 14.10 | 30.10 |
| 3 | 4924.00 | 44.40 PK | 74.00 | -29.60 | 1.03 H | 214 | 7.70 | 36.70 |
| 4 | 7386.00 | 49.90 PK | 74.00 | -24.10 | 1.05 H | 148 | 8.10 | 41.80 |
| 5 | 9848.00 | 52.60 PK | 74.00 | -21.40 | 1.02 H | 95 | 8.30 | 44.40 |
| 5 | 9848.00 | 41.00 AV | 54.00 | -13.00 | 1.02 H | 95 | -3.30 | 44.40 |

| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | *2462.00 | 111.00 PK | | | 1.03 V | 166 | 80.90 | 30.10 |
| 1 | *2462.00 | 103.80 AV | | | 1.03 V | 166 | 73.70 | 30.10 |
| 2 | 2483.50 | 57.40 PK | 74.00 | -16.60 | 1.00 V | 157 | 27.20 | 30.10 |
| 2 | 2483.50 | 50.10 AV | 54.00 | -3.90 | 1.00 V | 157 | 20.00 | 30.10 |
| 3 | 4924.00 | 44.60 PK | 74.00 | -29.40 | 1.01 V | 173 | 7.90 | 36.70 |
| 4 | 7386.00 | 48.90 PK | 74.00 | -25.10 | 1.07 V | 173 | 7.10 | 41.80 |
| 5 | 9848.00 | 52.90 PK | 74.00 | -21.10 | 1.46 V | 102 | 8.50 | 44.40 |
| 5 | 9848.00 | 41.20 AV | 54.00 | -12.80 | 1.46 V | 102 | -3.10 | 44.40 |

**REMARKS**:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The limit value is defined as per 15.247
6. " * " : Fundamental frequency

## TEST RESULTS (B)- OFDM

| | | | |
|---|---|---|---|
| **EUT** | Symbol Wireless Networker 802.11a/g PCI Adapter | **MODEL** | LA-5033 |
| **MODE** | Channel 1 | **FREQUENCY RANGE** | 1000MHz~25000MHz |
| **INPUT POWER (SYSTEM)** | 120Vac, 60Hz | **DETECTOR FUNCTION** | Peak(PK)<br>Average (AV) |
| **ENVIRONMENTAL CONDITIONS** | 24deg. C, 64%RH, 980 hPa | **TESTED BY** | Tony Chen |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | 2390.00 | 43.60 PK | 74.00 | -30.40 | 1.32 H | 215 | 13.80 | 29.80 |
| 2 | *2412.00 | 92.20 PK | | | 1.36 H | 221 | 62.30 | 29.90 |
| 2 | *2412.00 | 84.30 AV | | | 1.36 H | 221 | 54.40 | 29.90 |
| 3 | 4824.00 | 44.20 PK | 74.00 | -29.80 | 1.31 H | 209 | 8.00 | 36.20 |
| 4 | 7236.00 | 49.00 PK | 74.00 | -25.00 | 1.25 H | 252 | 7.40 | 41.70 |
| 5 | 9648.00 | 52.60 PK | 74.00 | -21.40 | 1.27 H | 230 | 7.70 | 44.90 |
| 5 | 9648.00 | 41.10 AV | 54.00 | -12.90 | 1.27 H | 230 | -3.80 | 44.90 |

| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | 2390.00 | 56.90 PK | 74.00 | -17.10 | 1.07 V | 138 | 27.10 | 29.80 |
| 1 | 2390.00 | 49.20 AV | 54.00 | -4.80 | 1.07 V | 138 | 19.40 | 29.80 |
| 2 | *2412.00 | 105.50 PK | | | 1.10 V | 132 | 75.60 | 29.90 |
| 2 | *2412.00 | 97.80 AV | | | 1.10 V | 132 | 67.90 | 29.90 |
| 3 | 4824.00 | 44.30 PK | 74.00 | -29.70 | 1.02 V | 37 | 8.10 | 36.20 |
| 4 | 7236.00 | 49.40 PK | 74.00 | -24.60 | 1.02 V | 37 | 7.80 | 41.70 |
| 5 | 9648.00 | 51.90 PK | 74.00 | -22.10 | 1.02 V | 77 | 7.00 | 44.90 |
| 5 | 9648.00 | 40.90 AV | 54.00 | -13.10 | 1.02 V | 77 | -4.00 | 44.90 |

**REMARKS**:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The limit value is defined as per 15.247
6. “ * “ : Fundamental frequency

| | | | |
|---|---|---|---|
| **EUT** | Symbol Wireless Networker 802.11a/g PCI Adapter | **MODEL** | LA-5033 |
| **MODE** | Channel 6 | **FREQUENCY RANGE** | 1000MHz~25000MHz |
| **INPUT POWER (SYSTEM)** | 120Vac, 60Hz | **DETECTOR FUNCTION** | Peak(PK)<br>Average (AV) |
| **ENVIRONMENTAL CONDITIONS** | 24deg. C, 64%RH, 980 hPa | **TESTED BY** | Tony Chen |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | *2437.00 | 92.50 PK | | | 1.11 H | 146 | 62.50 | 30.00 |
| 1 | *2437.00 | 84.90 AV | | | 1.11 H | 146 | 54.90 | 30.00 |
| 2 | 4874.00 | 44.60 PK | 74.00 | -29.40 | 1.16 H | 0 | 8.10 | 36.50 |
| 3 | 7311.00 | 49.00 PK | 74.00 | -25.00 | 1.17 H | 75 | 7.20 | 41.80 |
| 4 | 9748.00 | 54.00 PK | 74.00 | -20.00 | 1.19 H | 232 | 9.40 | 44.60 |
| 4 | 9748.00 | 41.80 AV | 54.00 | -12.20 | 1.19 H | 232 | -2.90 | 44.60 |

| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | *2437.00 | 103.90 PK | | | 1.07 V | 130 | 73.90 | 30.00 |
| 1 | *2437.00 | 96.10 AV | | | 1.07 V | 130 | 66.10 | 30.00 |
| 2 | 4874.00 | 45.30 PK | 74.00 | -28.70 | 1.11 V | 105 | 8.80 | 36.50 |
| 3 | 7311.00 | 49.50 PK | 74.00 | -24.50 | 1.12 V | 308 | 7.80 | 41.80 |
| 4 | 9748.00 | 52.40 PK | 74.00 | -21.60 | 1.12 V | 359 | 7.80 | 44.60 |
| 4 | 9748.00 | 41.70 AV | 54.00 | -12.30 | 1.12 V | 359 | -2.90 | 44.60 |

**REMARKS**:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The limit value is defined as per 15.247
6. “ * “ : Fundamental frequency

| | | | |
|---|---|---|---|
| **EUT** | Symbol Wireless Networker 802.11a/g PCI Adapter | **MODEL** | LA-5033 |
| **MODE** | Channel 11 | **FREQUENCY RANGE** | 1000MHz~25000MHz |
| **INPUT POWER (SYSTEM)** | 120Vac, 60Hz | **DETECTOR FUNCTION** | Peak(PK)<br>Average (AV) |
| **ENVIRONMENTAL CONDITIONS** | 24deg. C, 64%RH, 980 hPa | **TESTED BY** | Tony Chen |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | *2462.00 | 91.00 PK | | | 1.09 H | 148 | 61.00 | 30.10 |
| 1 | *2462.00 | 83.50 AV | | | 1.09 H | 148 | 53.40 | 30.10 |
| 2 | 2483.50 | 42.80 PK | 74.00 | -31.20 | 1.10 H | 152 | 12.70 | 30.10 |
| 3 | 4924.00 | 43.60 PK | 74.00 | -30.40 | 1.05 H | 126 | 6.90 | 36.70 |
| 4 | 7386.00 | 49.70 PK | 74.00 | -24.30 | 1.06 H | 138 | 7.80 | 41.80 |
| 5 | 9848.00 | 50.30 PK | 74.00 | -23.70 | 1.07 H | 0 | 6.00 | 44.40 |

| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | *2462.00 | 104.60 PK | | | 1.05 V | 169 | 74.50 | 30.10 |
| 1 | *2462.00 | 96.90 AV | | | 1.05 V | 169 | 66.80 | 30.10 |
| 2 | 2483.50 | 56.30 PK | 74.00 | -17.70 | 1.08 V | 173 | 26.20 | 30.10 |
| 2 | 2483.50 | 48.60 AV | 54.00 | -5.40 | 1.08 V | 173 | 18.50 | 30.10 |
| 3 | 4924.00 | 44.30 PK | 74.00 | -29.70 | 1.08 V | 124 | 7.70 | 36.70 |
| 4 | 7386.00 | 50.00 PK | 74.00 | -24.00 | 1.07 V | 1 | 8.20 | 41.80 |
| 5 | 9848.00 | 52.40 PK | 74.00 | -21.60 | 1.04 V | 136 | 8.10 | 44.40 |
| 5 | 9848.00 | 41.20 AV | 54.00 | -12.80 | 1.04 V | 136 | -3.10 | 44.40 |

**REMARKS**:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The limit value is defined as per 15.247
6. " * " : Fundamental frequency

## 4.3 6dB BANDWIDTH MEASUREMENT

### 4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

### 4.3.2 TEST INSTRUMENTS

| Description & Manufacturer | Model No. | Serial No. | Calibrated Until |
|---|---|---|---|
| R&S SPECTRUM ANALYZER | FSP40 | 100037 | May. 06, 2004 |

**NOTE:**

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

### 4.3.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100kHz RBW and 100kHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6 dB.

### 4.3.4 DEVIATION FROM TEST STANDARD

No deviation

### 4.3.5 TEST SETUP

### 4.3.6 EUT OPERATING CONDITIONS

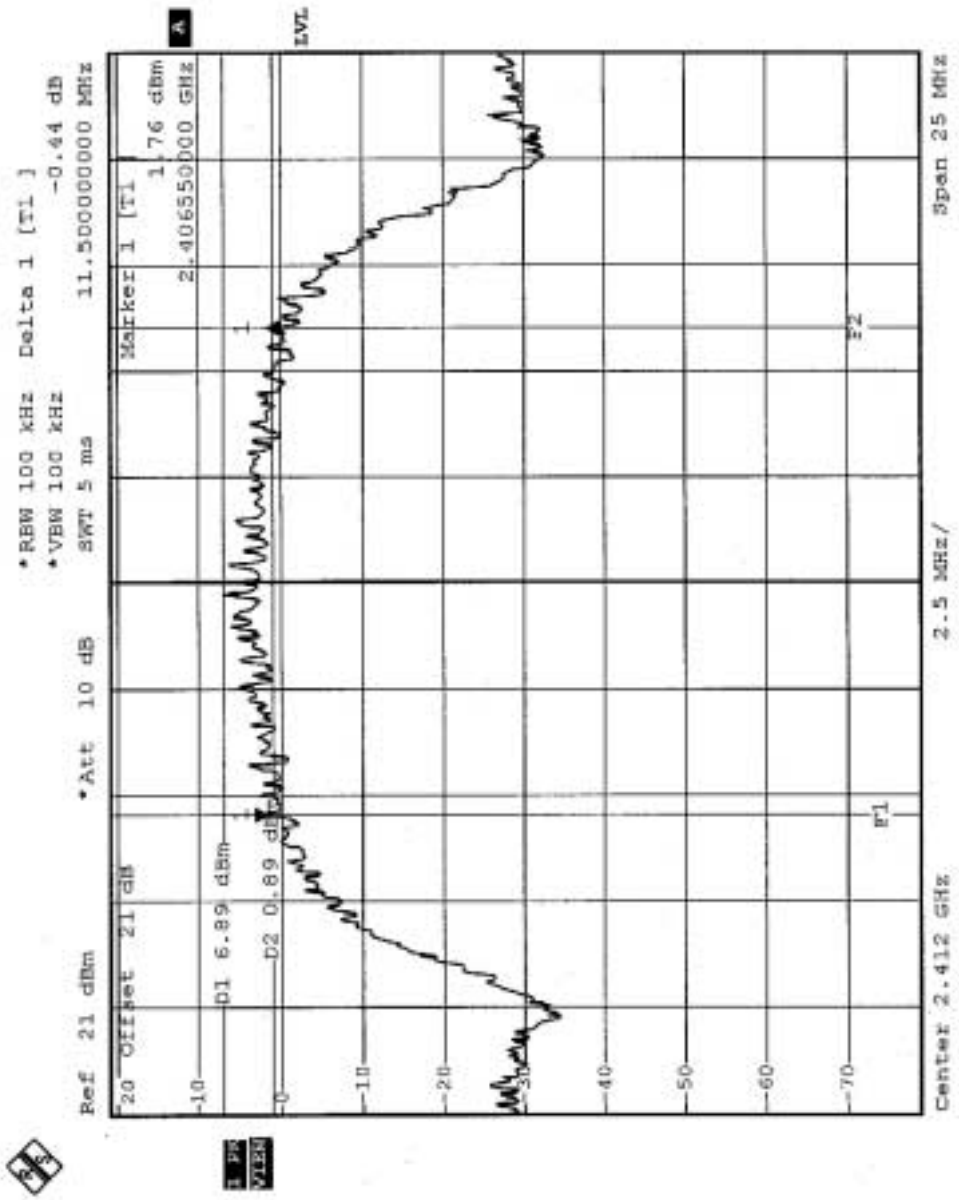
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

## 4.3.7 TEST RESULTS (A)

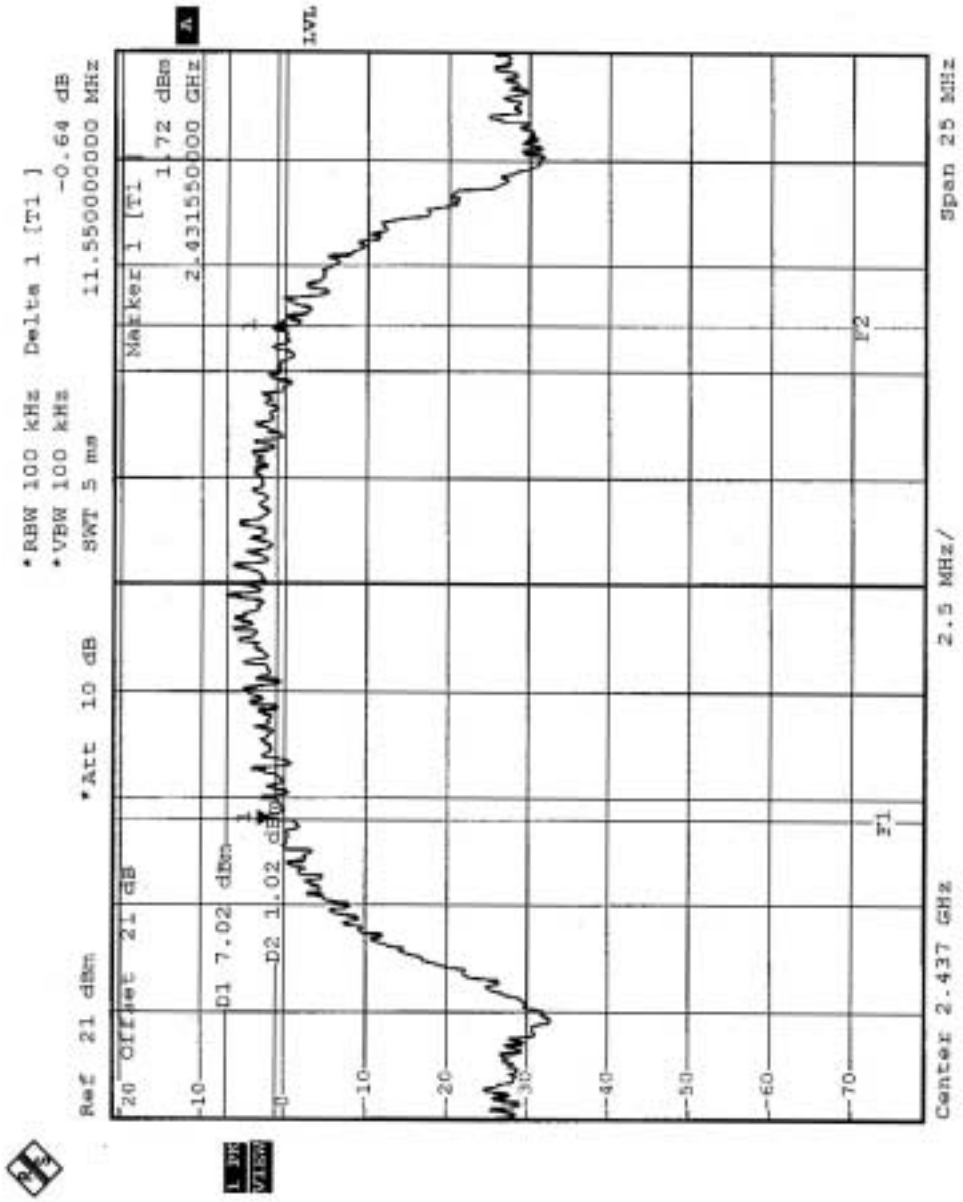
| | | | |
|---|---|---|---|
| **EUT** | Symbol Wireless Networker 802.11a/g PCI Adapter | **MODEL** | LA-5033 |
| **INPUT POWER (SYSTEM)** | 120Vac, 60Hz | **ENVIRONMENTAL CONDITIONS** | 27deg. C, 58%RH<br>980 hPa |
| **TESTED BY** | Tony Chen | | |

| CHANNEL | CHANNEL FREQUENCY (MHz) | 6dB BANDWIDTH (MHz) | MINIMUM LIMIT (MHz) | PASS/FAIL |
|---|---|---|---|---|
| 1 | 2412 | 11.5 | 0.5 | PASS |
| 6 | 2437 | 11.55 | 0.5 | PASS |
| 11 | 2462 | 11.5 | 0.5 | PASS |

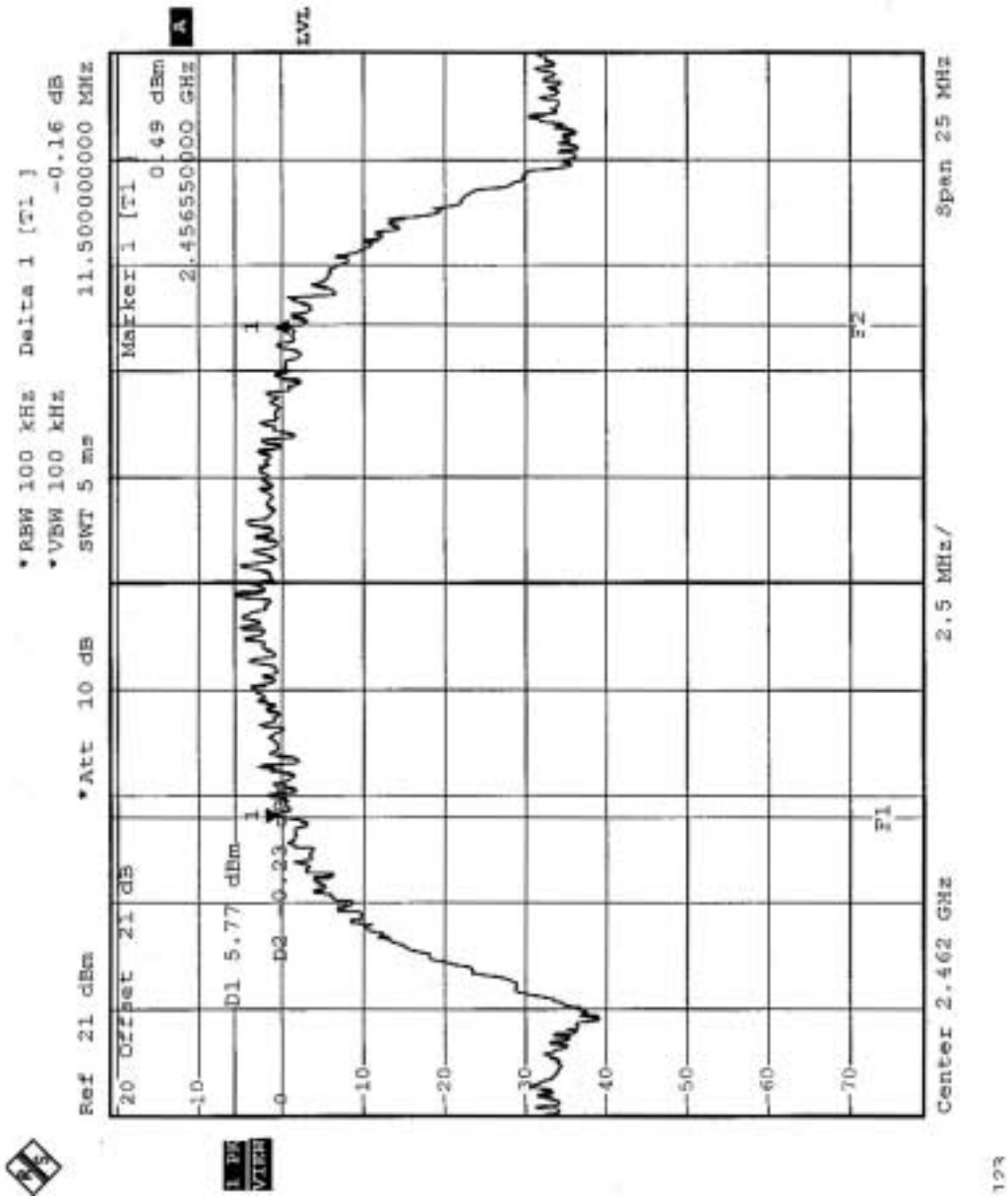
CH1


Ref 21 dBm
Att 10 dB
RBW 100 kHz
VBW 100 kHz
SWT 5 ms
Delta 1 [T1 ]
-0.44 dB
11.50000000 MHz
Marker 1 [T1 ]
1.76 dBm
2.40650000 GHz
D1 6.89 dBm
D2 0.89 dB
Span 25 MHz
2.5 MHz/
Center 2.412 GHz

CH6


Ref 21 dBm
Offset 21 dB
*Att 10 dB
*RBW 100 kHz
*VBW 100 kHz
SWT 5 ms
Delta 1 [T1 ]
-0.64 dB
11.55000000 MHz
Marker 1 [T1 ]
1.72 dBm
2.431550000 GHz
D1 7.02 dBm
D2 1.02 dB
Center 2.437 GHz
2.5 MHz/
Span 25 MHz

CH11

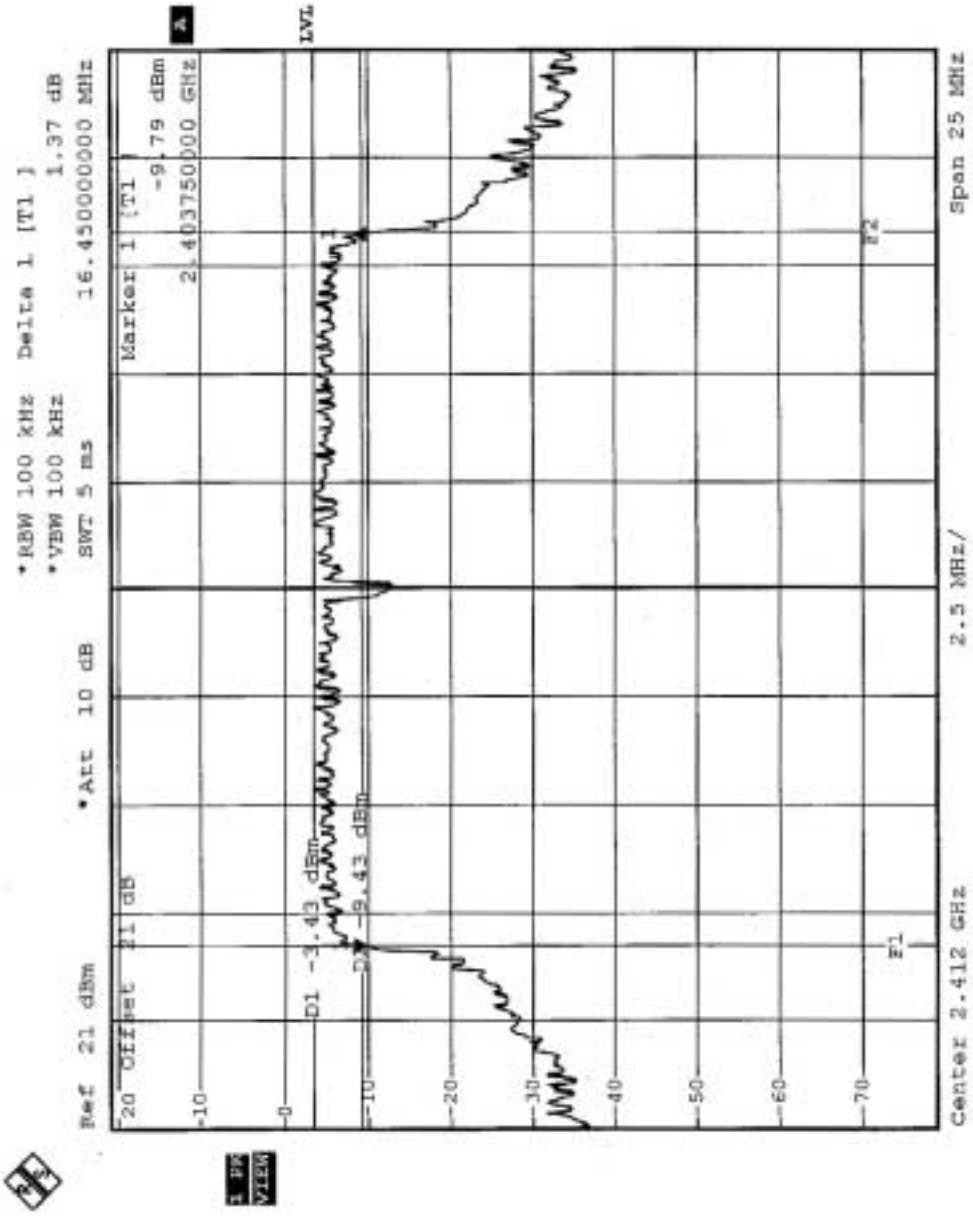

Ref 21 dBm
Att 10 dB
RBW 100 kHz
VBW 100 kHz
SWT 5 ms
Delta 1 [T1 ]
-0.16 dB
11.500000000 MHz
Marker 1 [T1 ]
0.49 dBm
2.456550000 GHz
D1 5.77 dBm
D2 -0.23
Center 2.462 GHz
2.5 MHz/
Span 25 MHz

## 4.3.8 TEST RESULTS (B)

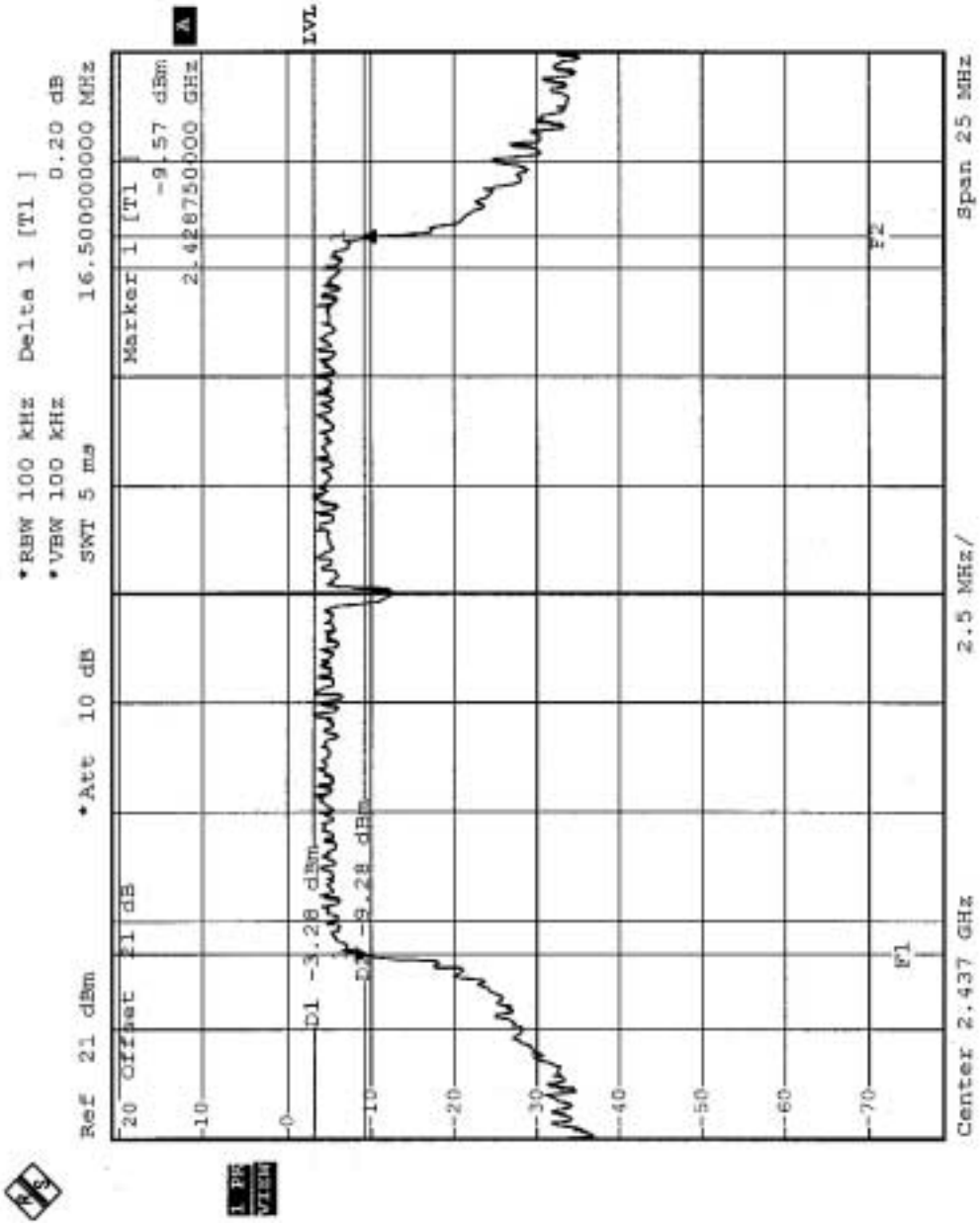
| | | | |
|---|---|---|---|
| **EUT** | Symbol Wireless Networker 802.11a/g PCI Adapter | **MODEL** | LA-5033 |
| **INPUT POWER (SYSTEM)** | 120Vac, 60Hz | **ENVIRONMENTAL CONDITIONS** | 27deg. C, 58%RH<br>980 hPa |
| **TESTED BY** | Tony Chen | | |

| CHANNEL | CHANNEL FREQUENCY (MHz) | 6dB BANDWIDTH (MHz) | MINIMUM LIMIT (MHz) | PASS/FAIL |
|---|---|---|---|---|
| 1 | 2412 | 16.45 | 0.5 | PASS |
| 6 | 2437 | 16.5 | 0.5 | PASS |
| 11 | 2462 | 16.5 | 0.5 | PASS |

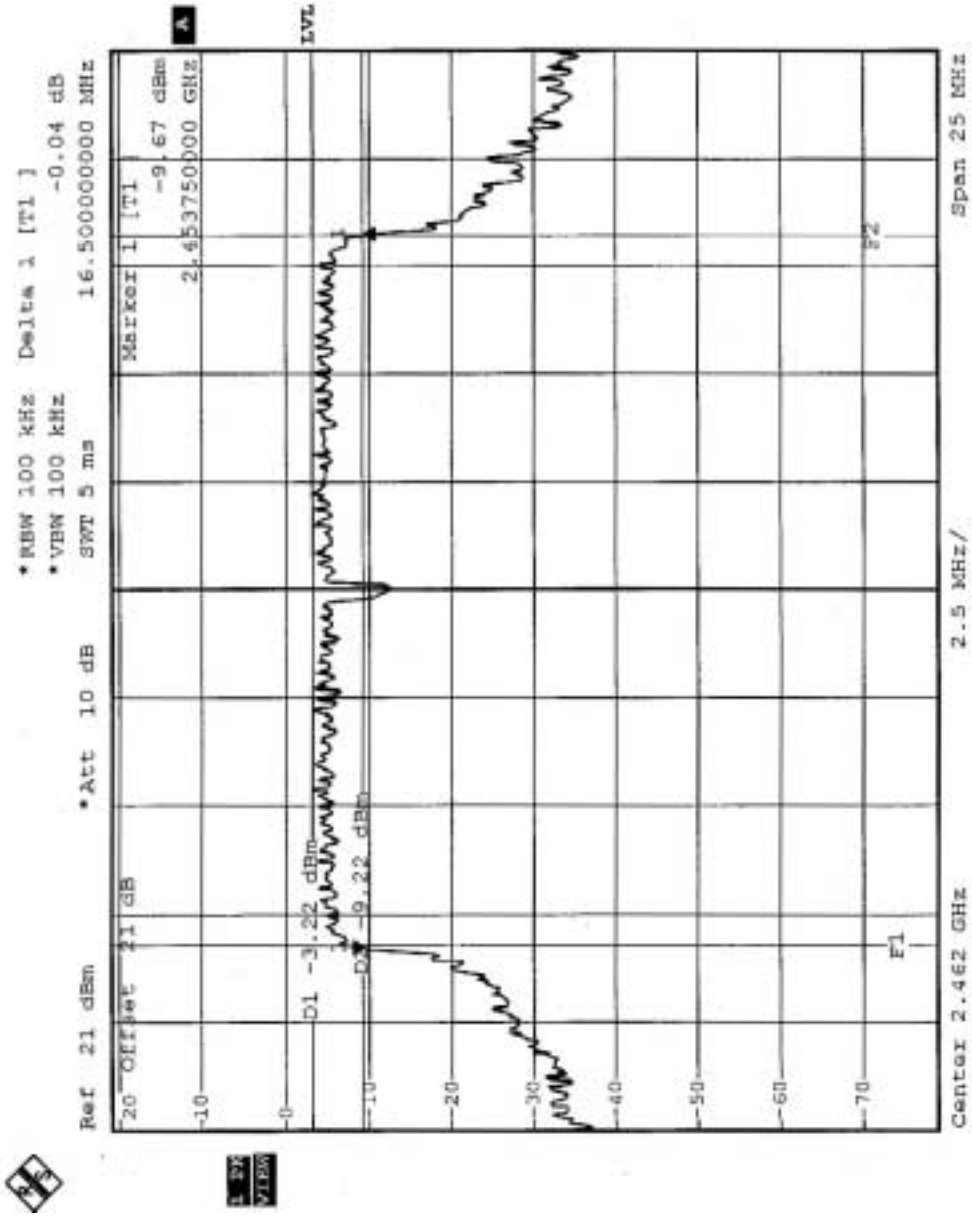
CH1


Ref 21 dBm
Att 10 dB
RBW 100 kHz
VBW 100 kHz
SWT 5 ms
Delta 1 [T1 ]
1.37 dB
16.45000000 MHz
Marker 1 [T1 ]
-9.79 dBm
2.40375000 GHz
D1 -3.43 dBm
D2 -9.43 dBm
Center 2.412 GHz
2.5 MHz/
Span 25 MHz

CH6


Ref 21 dBm
Offset 21 dB
Att 10 dB
RBW 100 kHz
VBW 100 kHz
SWT 5 ms
Delta 1 [T1 ]
0.20 dB
16.500000000 MHz
Marker 1 [T1 ]
-9.57 dBm
2.428750000 GHz
D1 -3.28 dBm
D2 -9.28 dBm
F1
F2
LVL
Center 2.437 GHz
2.5 MHz/
Span 25 MHz

CH11


Ref 21 dBm
Att 10 dB
RBW 100 kHz
VBW 100 kHz
SWT 5 ms
Delta 1 [T1 ]
-0.04 dB
16.50000000 MHz
Marker 1 [T1
-9.67 dBm
2.453750000 GHz
D1 -3.22 dBm
D2 -9.22 dBm
Center 2.462 GHz
2.5 MHz/
Span 25 MHz

## 4.4 MAXIMUM PEAK OUTPUT POWER

### 4.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

### 4.4.2 INSTRUMENTS

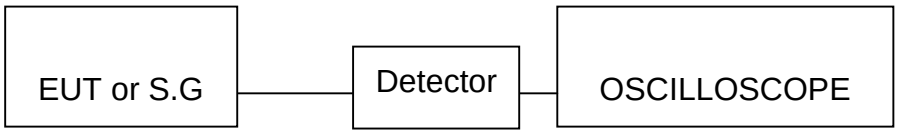
| Description & Manufacturer | Model No. | Serial No. | Calibrated Until |
|---|---|---|---|
| R&S SPECTRUM ANALYZER | FSP40 | 100037 | May. 06, 2004 |
| R&S SIGNAL GENERATOR | SMP04 | 100011 | May 28, 2004 |
| TEKTRONIX OSCILLOSCOPE | TDS 220 | B027241 | Jun. 29, 2004 |
| NARDA DETECTOR | 4503A | FSCM99899 | NA |

**NOTE:**
The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

### 4.4.3 TEST PROCEDURES

1. A detector was used on the output port of the EUT. An oscilloscope was used to read the peak response of the detector.
2. Replaced the EUT by the signal generator. The center frequency of the S.G was adjusted to the center frequency of the measured channel.
3. Adjusted the power to have the same peak reading on oscilloscope. Record the power level.

### 4.4.4 TEST SETUP




### 4.4.5 EUT OPERATING CONDITIONS

Same as Item 4.3.6

### 4.4.6 TEST RESULTS (A)

| | | | |
|---|---|---|---|
| **EUT** | Symbol Wireless Networker 802.11a/g PCI Adapter | **MODEL** | LA-5033 |
| **INPUT POWER (SYSTEM)** | 120Vac, 60Hz | **ENVIRONMENTAL CONDITIONS** | 24deg. C, 76%RH<br>980 hPa |
| **TESTED BY** | Tony Chen | | |

| CHANNEL | CHANNEL FREQUENCY (MHz) | PEAK POWER OUTPUT (dBm) | PEAK POWER LIMIT (dBm) | PASS/FAIL |
|---|---|---|---|---|
| 1 | 2412 | 17.79 | 30 | PASS |
| 6 | 2437 | 17.72 | 30 | PASS |
| 11 | 2462 | 17.59 | 30 | PASS |

### 4.4.7 TEST RESULTS (B)

| | | | |
|---|---|---|---|
| **EUT** | Symbol Wireless Networker 802.11a/g PCI Adapter | **MODEL** | LA-5033 |
| **INPUT POWER (SYSTEM)** | 120Vac, 60Hz | **ENVIRONMENTAL CONDITIONS** | 24deg. C, 76%RH<br>980 hPa |
| **TESTED BY** | Tony Chen | | |

| CHANNEL | CHANNEL FREQUENCY (MHz) | PEAK POWER OUTPUT (dBm) | PEAK POWER LIMIT (dBm) | PASS/FAIL |
|---|---|---|---|---|
| 1 | 2412 | 14.46 | 30 | PASS |
| 6 | 2437 | 14.63 | 30 | PASS |
| 11 | 2462 | 14.51 | 30 | PASS |

## 4.5 POWER SPECTRAL DENSITY MEASUREMENT

### 4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

### 4.5.2 TEST INSTRUMENTS

| Description & Manufacturer | Model No. | Serial No. | Calibrated Until |
|---|---|---|---|
| R&S SPECTRUM ANALYZER | FSP40 | 100037 | May. 06, 2004 |

**NOTE:**

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

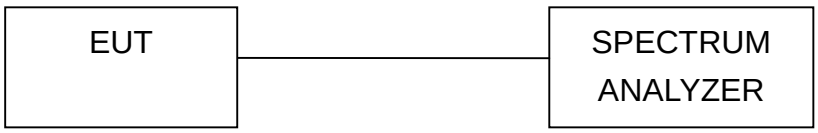
### 4.5.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3 kHz RBW and 30 kHz VBW, set sweep time = span/3 kHz. The power spectral density was measured and recorded.
The sweep time is allowed to be longer than span/3 kHz for a full response of the mixer in the spectrum analyzer.

### 4.5.4 DEVIATION FROM TEST STANDARD

No deviation

### 4.5.5 TEST SETUP




### 4.5.6 EUT OPERATING CONDITION

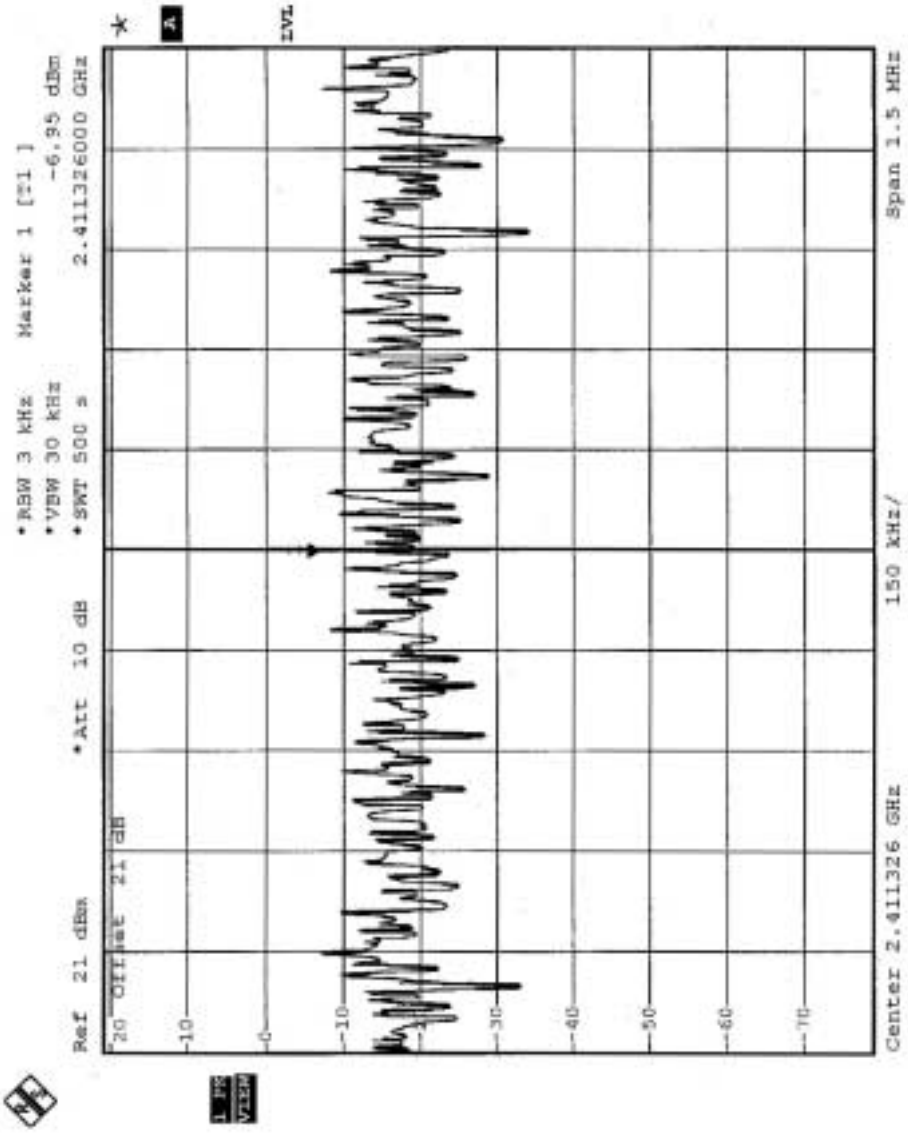
Same as Item 4.3.6

## 4.5.7 TEST RESULTS(A)

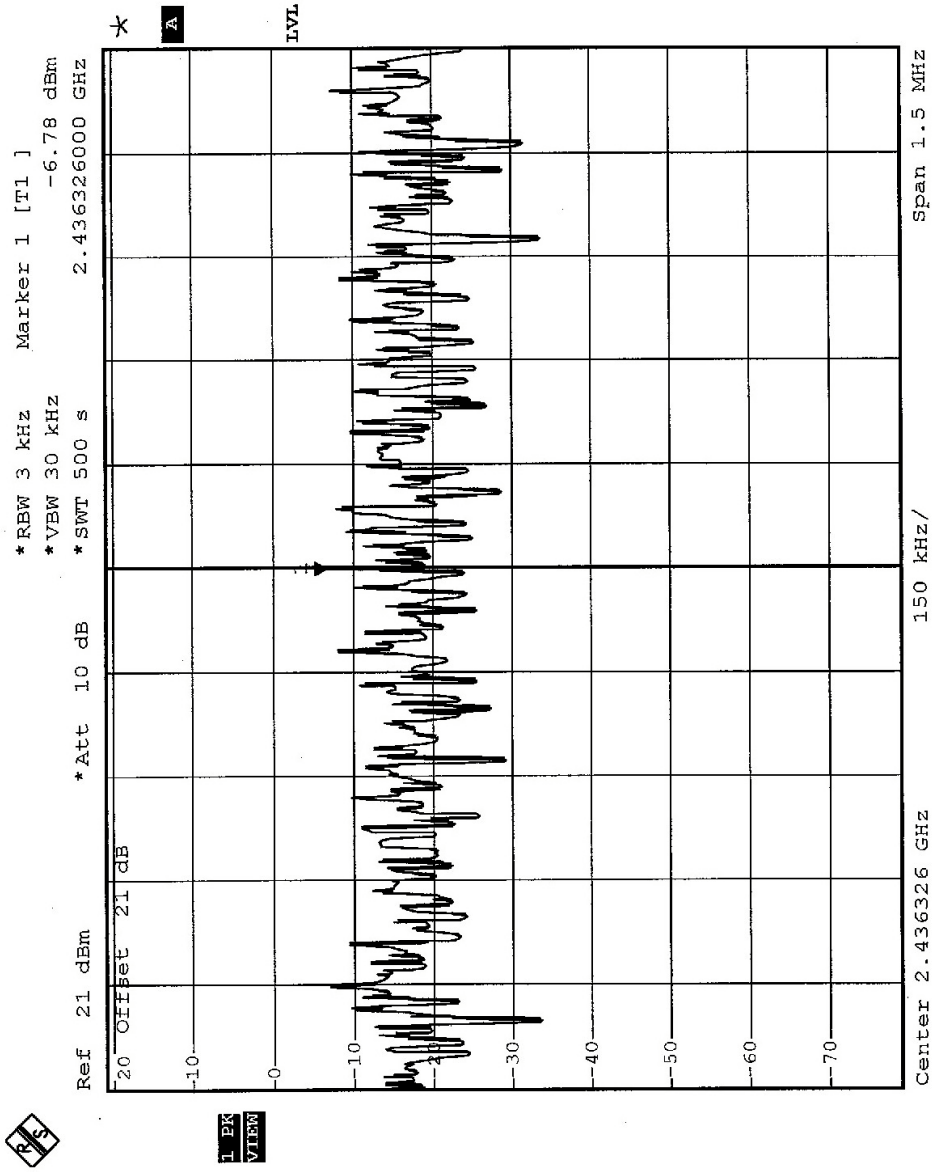
| | | | |
|---|---|---|---|
| **EUT** | Symbol Wireless Networker 802.11a/g PCI Adapter | **MODEL** | LA-5033 |
| **INPUT POWER (SYSTEM)** | 120Vac, 60Hz | **ENVIRONMENTAL CONDITIONS** | 24deg. C, 76RH, 980 hPa |
| **TESTED BY** | Tony Chen | | |

| CHANNEL NUMBER | CHANNEL FREQUENCY (MHz ) | RF POWER LEVEL IN 3 kHz BW (dBm) | MAXIMUM LIMIT (dBm) | PASS/FAIL |
|---|---|---|---|---|
| 1 | 2412 | -6.95 | 8 | PASS |
| 6 | 2437 | -6.78 | 8 | PASS |
| 11 | 2462 | -7.89 | 8 | PASS |

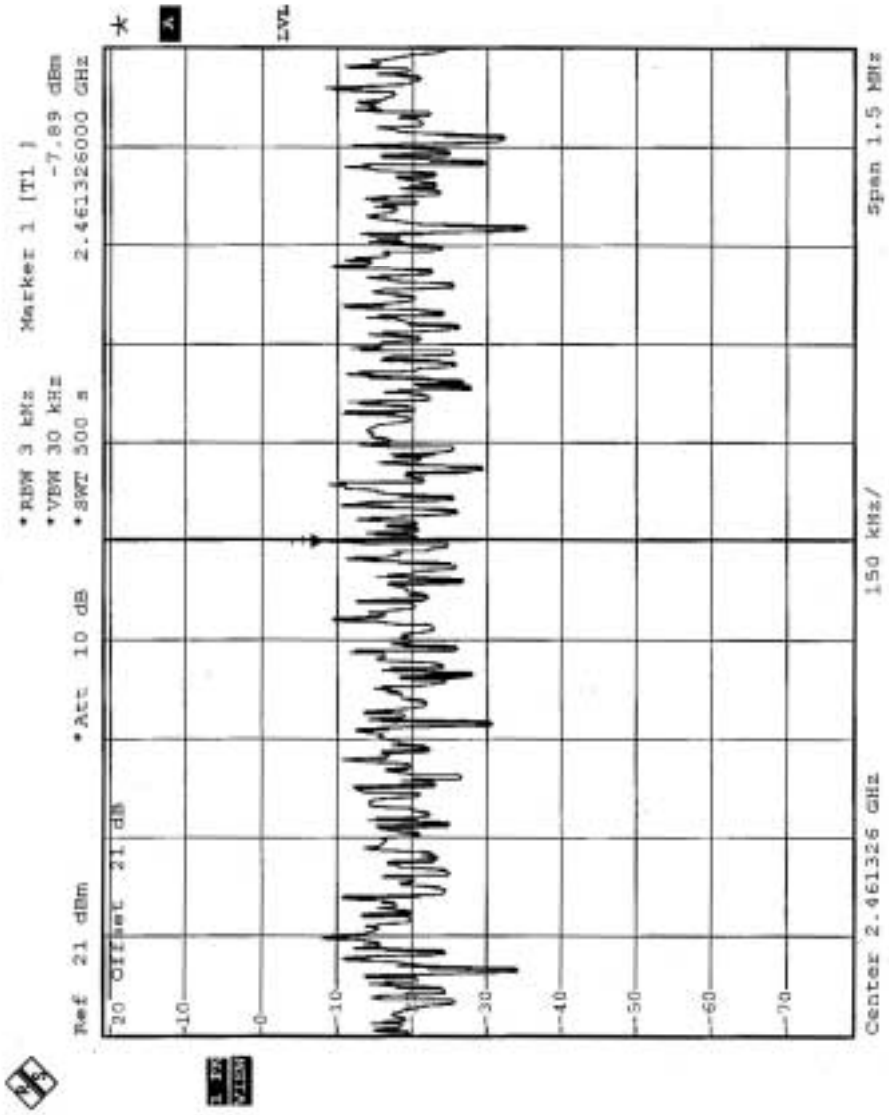
CH1


Ref 21 dBm
Offset 21 dB
Att 10 dB
RBW 3 kHz
VBW 30 kHz
SWT 500 s
Marker 1 [T1 ]
-6.95 dBm
2.411326000 GHz
Span 1.5 MHz
150 kHz/
Center 2.411326 GHz

CH6


Ref 21 dBm
Offset 21 dB
*Att 10 dB
*RBW 3 kHz
*VBW 30 kHz
*SWT 500 s
Marker 1 [T1 ]
-6.78 dBm
2.43632600 0 GHz
Center 2.436326 GHz
150 kHz/
Span 1.5 MHz
1 PK
VIEW
A
LVL

CH11

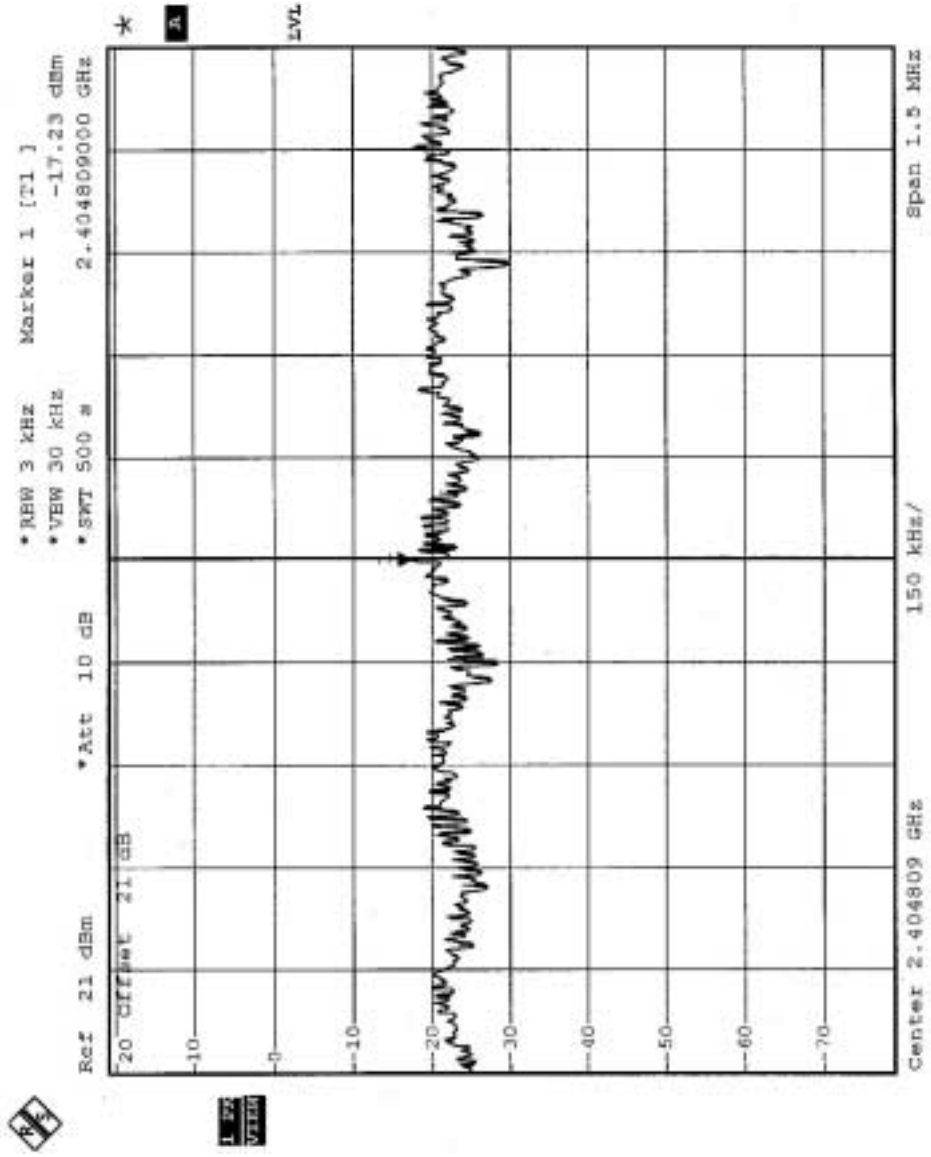

Ref 21 dBm
Offset 21 dB
*Att 10 dB
*RBW 3 kHz
*VBW 30 kHz
*SWT 500 s
Marker 1 [T1 ]
-7.89 dBm
2.461326000 GHz
Center 2.461326 GHz
150 kHz/
Span 1.5 MHz

## 4.5.8 TEST RESULTS(B)

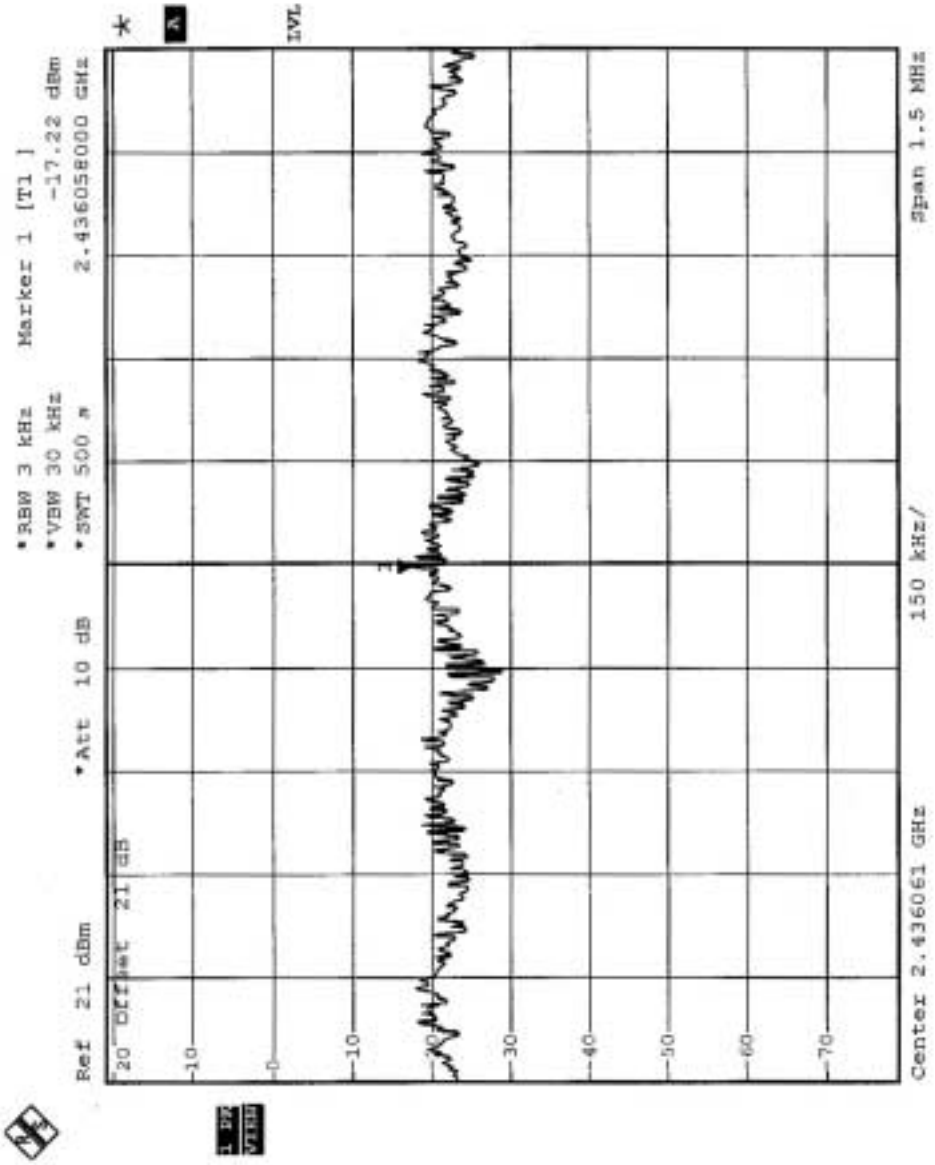
| | | | |
|---|---|---|---|
| **EUT** | Symbol Wireless Networker 802.11a/g PCI Adapter | **MODEL** | LA-5033 |
| **INPUT POWER (SYSTEM)** | 120Vac, 60Hz | **ENVIRONMENTAL CONDITIONS** | 24deg. C, 76RH, 980 hPa |
| **TESTED BY** | Tony Chen | | |

| CHANNEL NUMBER | CHANNEL FREQUENCY (MHz ) | RF POWER LEVEL IN 3 kHz BW (dBm) | MAXIMUM LIMIT (dBm) | PASS/FAIL |
|---|---|---|---|---|
| 1 | 2412 | -17.23 | 8 | PASS |
| 6 | 2437 | -17.22 | 8 | PASS |
| 11 | 2462 | -17.3 | 8 | PASS |

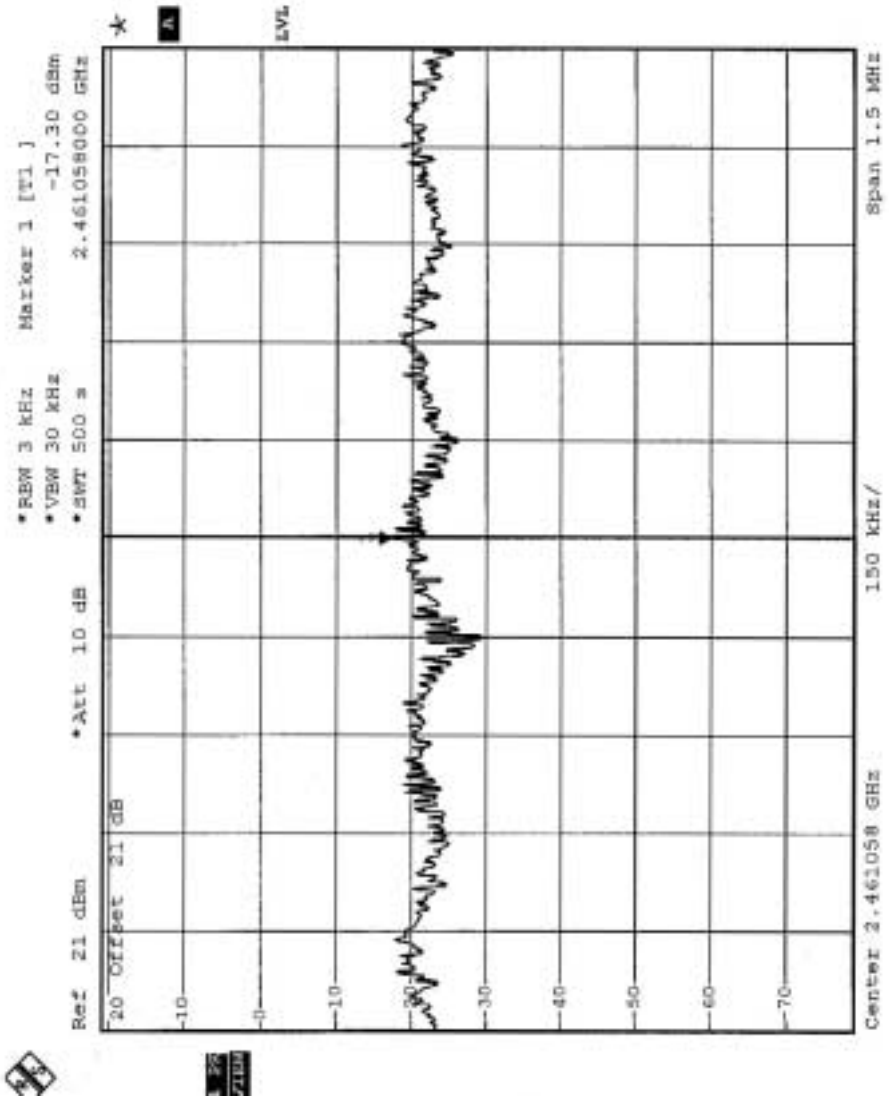
CH1


Ref 21 dBm
Att 10 dB
RBW 3 kHz
VBW 30 kHz
SWT 500 s
Marker 1 [T1 ]
-17.23 dBm
2.404809000 GHz
Center 2.404809 GHz
150 kHz/
Span 1.5 MHz

CH6


Ref 21 dBm
Offset 21 dB
*Att 10 dB
*RBW 3 kHz
*VBW 30 kHz
*SWT 500 m
Marker 1 [T1 ]
-17.22 dBm
2.43605000 GHz
Center 2.436061 GHz
150 kHz/
Span 1.5 MHz

CH11


Ref 21 dBm
Att 10 dB
RBW 3 kHz
VBW 30 kHz
SWT 500 s
Marker 1 [T1 ]
-17.30 dBm
2.461058000 GHz
Center 2.461058 GHz
150 kHz/
Span 1.5 MHz

## 4.6 BAND EDGES MEASUREMENT

### 4.6.1 LIMITS OF BAND EDGES MEASUREMENT

Below –20dB of the highest emission level of operating band (in 100KHz Resolution Bandwidth).

### 4.6.2 TEST INSTRUMENTS

| Description & Manufacturer | Model No. | Serial No. | Calibrated Until |
|---|---|---|---|
| R&S SPECTRUM ANALYZER | FSP40 | 100037 | May. 06, 2004 |

**NOTE:**

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

### 4.6.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer via a low lose cable. Set both RBW and VBW of spectrum analyzer to 100 kHz with suitable frequency span including 100 kHz bandwidth from band edge. The band edges was measured and recorded.

### 4.6.4 DEVIATION FROM TEST STANDARD

No deviation

### 4.6.5 EUT OPERATING CONDITION

Same as Item 4.3.6

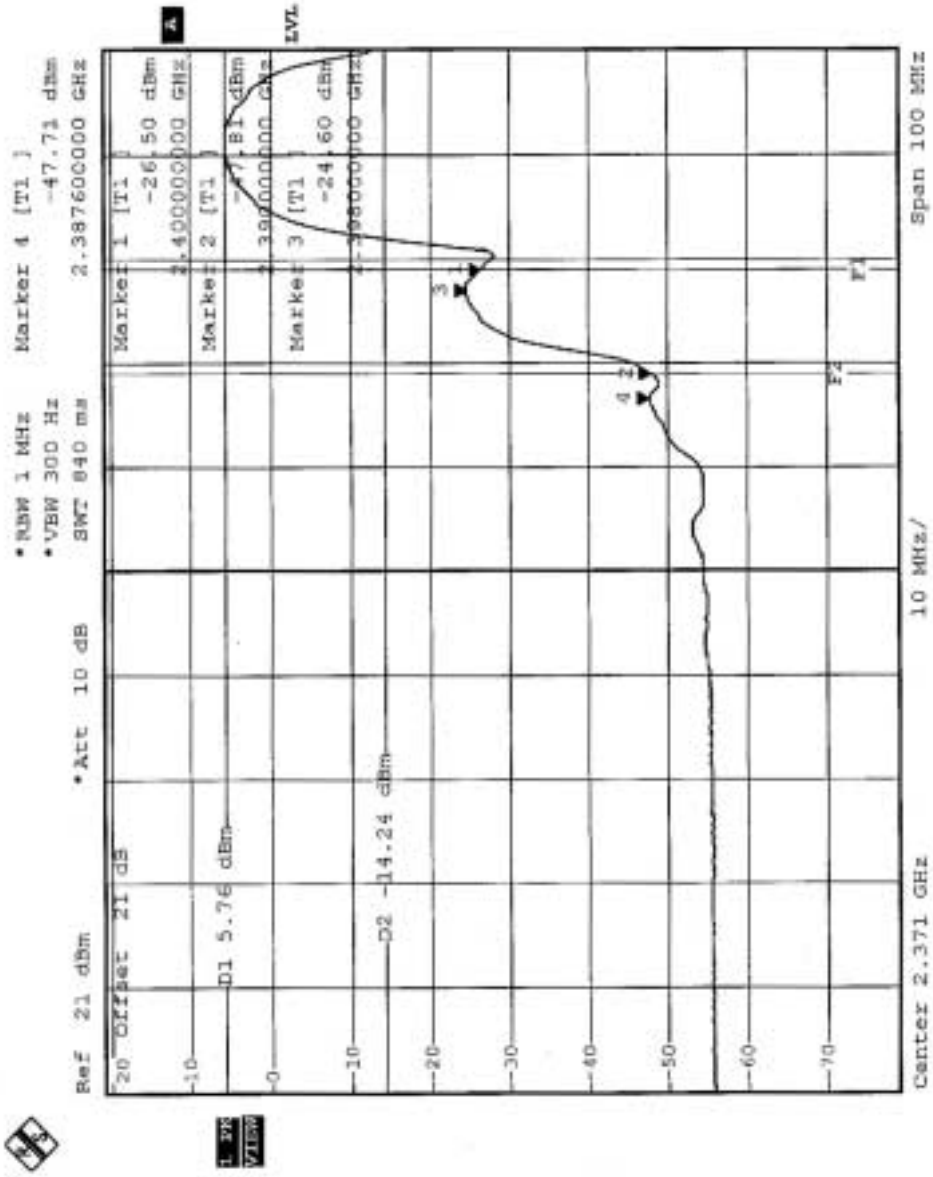
### 4.6.6 TEST RESULTS (A)

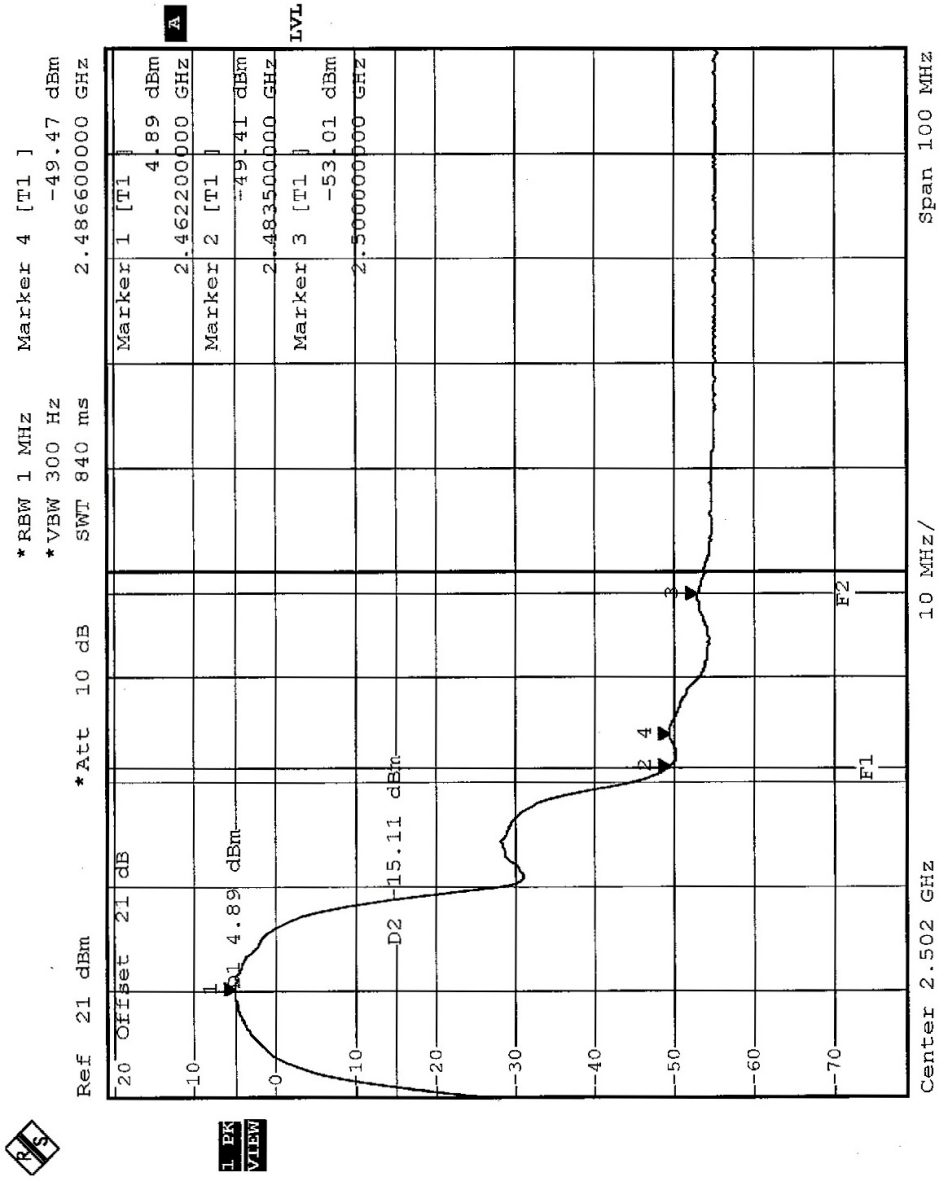
The spectrum plots are attached on the following 2 pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D2. It shows compliance with the requirement in part 15.247(C).

Note - The delta method is only used up to 2 MHz away from the restricted bandage, The radiated emissions which located in other restricted frequency band, the result, please refer to 4.2.

**NOTE (1):** The band edge emission plot on the following first page shows 53.57dB delta between carrier maximum power and local maximum emission in restrict band (2.3900GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2 is 105.7dBuV/m, so the maximum field strength in restrict band is 105.7-53.57=52.13dBuV/m which is under 54 dBuV/m limit.

**NOTE (2):** The band edge emission plot on the following second page shows 54.3 dB delta between carrier maximum power and local maximum emission in restrict band (2.4835GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2 is 103.8dBuV/m, so the maximum field strength in restrict band is 103.8-54.3=49.5dBuV/m which is under 54 dBuV/m limit.


Ref 21 dBm
Offset 21 dB
*Att 10 dB
*RBW 1 MHz
*VBW 300 Hz
SWT 840 ms
Marker 4 [T1 ]
-47.71 dBm
2.387600000 GHz
Marker 1 [T1 ]
-26.50 dBm
2.400000000 GHz
Marker 2 [T1 ]
-27.81 dBm
2.390000000 GHz
Marker 3 [T1 ]
-24.60 dBm
2.398000000 GHz
D1 5.76 dBm
D2 -14.24 dBm
Center 2.371 GHz
10 MHz/
Span 100 MHz


Ref 21 dBm
Offset 21 dB
*Att 10 dB
*RBW 1 MHz
*VBW 300 Hz
SWT 840 ms
Marker 4 [T1 ]
-49.47 dBm
2.486600000 GHz
Marker 1 [T1 ]
4.89 dBm
2.462200000 GHz
Marker 2 [T1 ]
-49.41 dBm
2.483500000 GHz
Marker 3 [T1 ]
-53.01 dBm
2.500000000 GHz
D1 4.89 dBm
D2 -15.11 dBm
F1
F2
Center 2.502 GHz
10 MHz/
Span 100 MHz
1 PK
VIEW
A
LVL

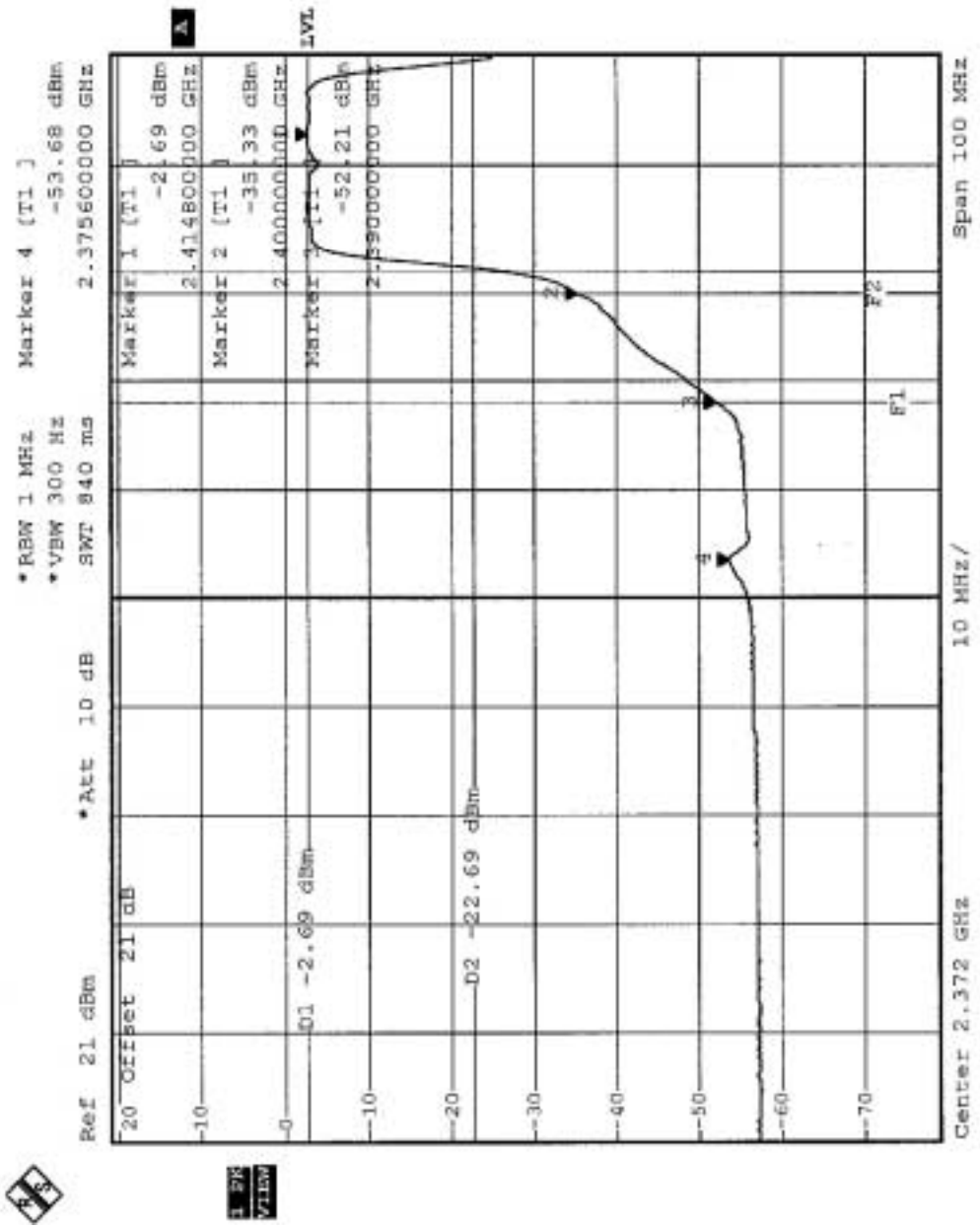
### 4.6.7 TEST RESULTS (B)

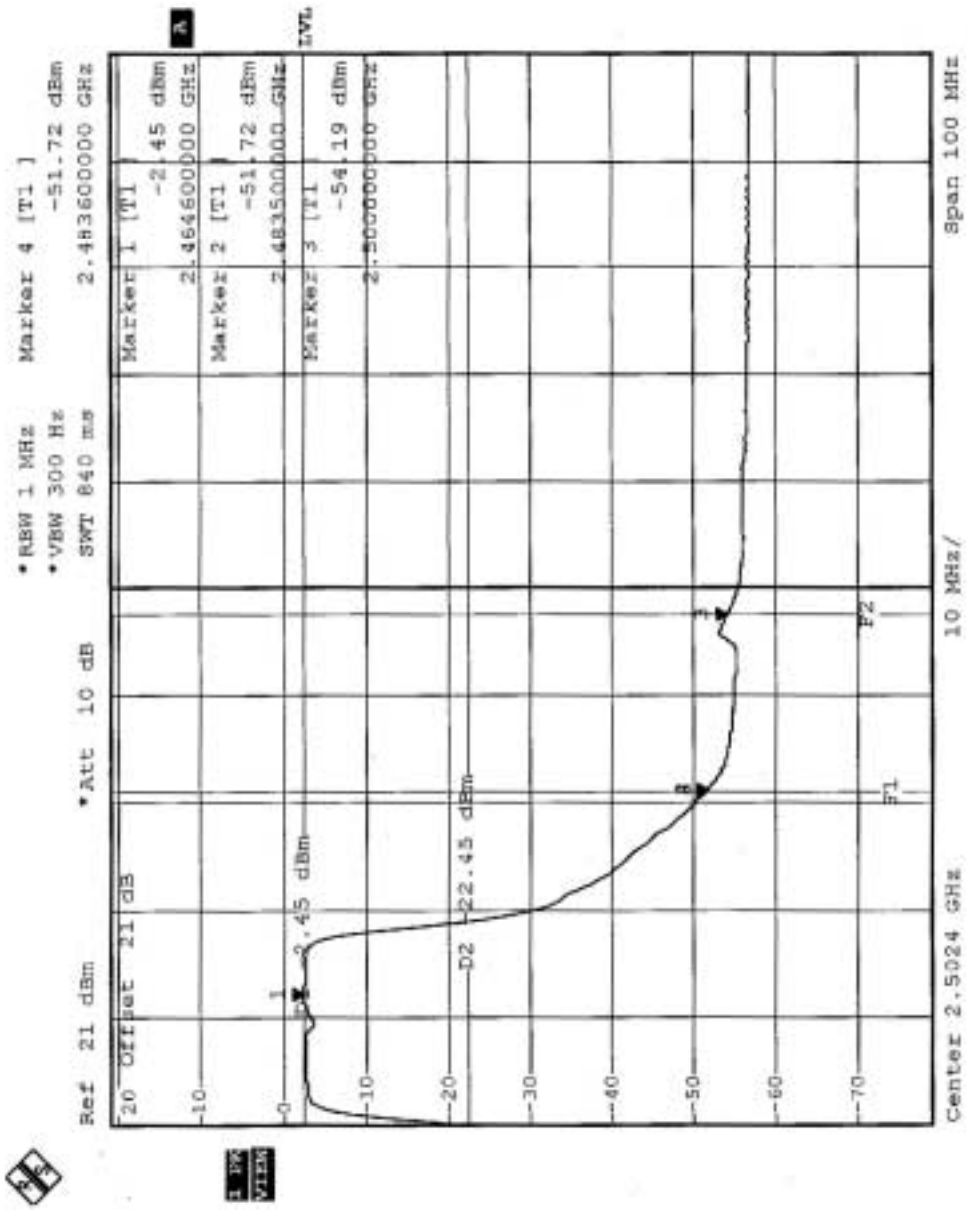
The spectrum plots are attached on the following 2 pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D2. It shows compliance with the requirement in part 15.247(C).

Note - The delta method is only used up to 2 MHz away from the restricted bandage, The radiated emissions which located in other restricted frequency band, the result, please refer to 4.2.

**NOTE (1):** The band edge emission plot on the following first page shows 49.52dB delta between carrier maximum power and local maximum emission in restrict band (2.390GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2 is 97.8dBuV/m, so the maximum field strength in restrict band is 97.8-49.52=48.28dBuV/m which is under 54 dBuV/m limit.

**NOTE (2):** The band edge emission plot on the following second page shows 49.27 dB delta between carrier maximum power and local maximum emission in restrict band (2.4835GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2 is 96.9dBuV/m, so the maximum field strength in restrict band is 96.9-49.27=47.63 dBuV/m which is under 54 dBuV/m limit.


Ref 21 dBm
Att 10 dB
RBW 1 MHz
VBW 300 Hz
SWT 840 ms
Marker 4 [T1 ]
-53.68 dBm
2.375600000 GHz
Marker 1 [T1 ]
-2.69 dBm
2.414800000 GHz
Marker 2 [T1 ]
-35.33 dBm
2.400000000 GHz
Marker 3 [T1 ]
-52.21 dBm
2.390000000 GHz
Offset 21 dB
D1 -2.69 dBm
D2 -22.69 dBm
LVL
Center 2.372 GHz
10 MHz/
Span 100 MHz


Ref 21 dBm
Att 10 dB
RBW 1 MHz
VBW 300 Hz
SWT 840 ms
Marker 4 [T1 ]
-51.72 dBm
2.48360000 GHz
Marker 1 [T1 ]
-2.45 dBm
2.46600000 GHz
Marker 2 [T1 ]
-51.72 dBm
2.48350000 GHz
Marker 3 [T1 ]
-54.19 dBm
2.50000000 GHz
2.45 dBm
-2.45 dBm
D2
F1
F2
Center 2.5024 GHz
10 MHz/
Span 100 MHz

## 4.7 ANTENNA REQUIREMENT

### 4.7.1 STANDARD APPLICABLE

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

### 4.7.2 ANTENNA CONNECTED CONSTRUCTION

The antenna used in this product is Integral Dipole antenna with 5ft cable without connector. The maximum Gain of the antenna is 0dBi.

# 5. TEST TYPES AND RESULTS (FOR PART 802.11a)

## 5.1 CONDUCTED EMISSION MEASUREMENT

### 5.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

| FREQUENCY OF EMISSION (MHz) | CONDUCTED LIMIT (dBµV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15-0.5 | 66 to 56 | 56 to 46 |
| 0.5-5 | 56 | 46 |
| 5-30 | 60 | 50 |

**NOTE**:
1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.
3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

### 5.1.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED UNTIL |
|---|---|---|---|
| ROHDE & SCHWARZ Test Receiver | ESCS 30 | 847124/029 | Dec. 4, 2004 |
| ROHDE & SCHWARZ LISN (for EUT) | ESHS-Z5 | 848773/004 | Nov. 04, 2004 |
| KYORITSU LISN (for peripheral) | KNW-407 | 8/1395/12 | Jul. 27, 2004 |
| RF Cable (JETBAO) | RG233/U | Cable_CA_01 | Jul. 03, 2004 |
| Terminator(for KYORITSU) | 50 | 3 | Apr. 11, 2004 |
| Software | Cond-V2e | NA | NA |

NOTE:
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. The test was performed in ADT Shielded Room No. A.
3. The VCCI Con A Registration No. is C-817.

### 5.1.3 TEST PROCEDURES

a. The EUT/HOST was placed 0.4 meters from the conducting wall of the shielded room with EUT/HOST being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.

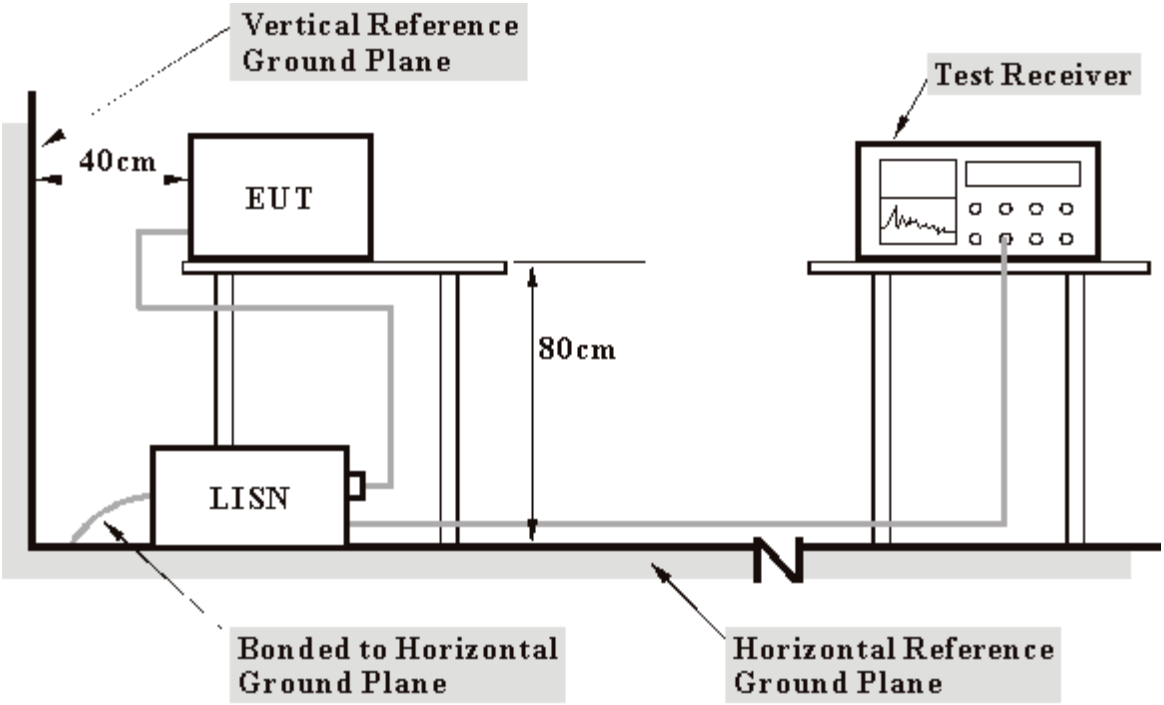
b. Both lines of the power mains connected to the EUT/HOST were checked for maximum conducted interference.

c. The frequency range from 150 kHz to 30 MHz was searched. Emission levels over 10dB under the prescribed limits could not be reported

### 5.1.4 DEVIATION FROM TEST STANDARD

No deviation

### 5.1.5 TEST SETUP




Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

### 5.1.6 EUT OPERATING CONDITIONS

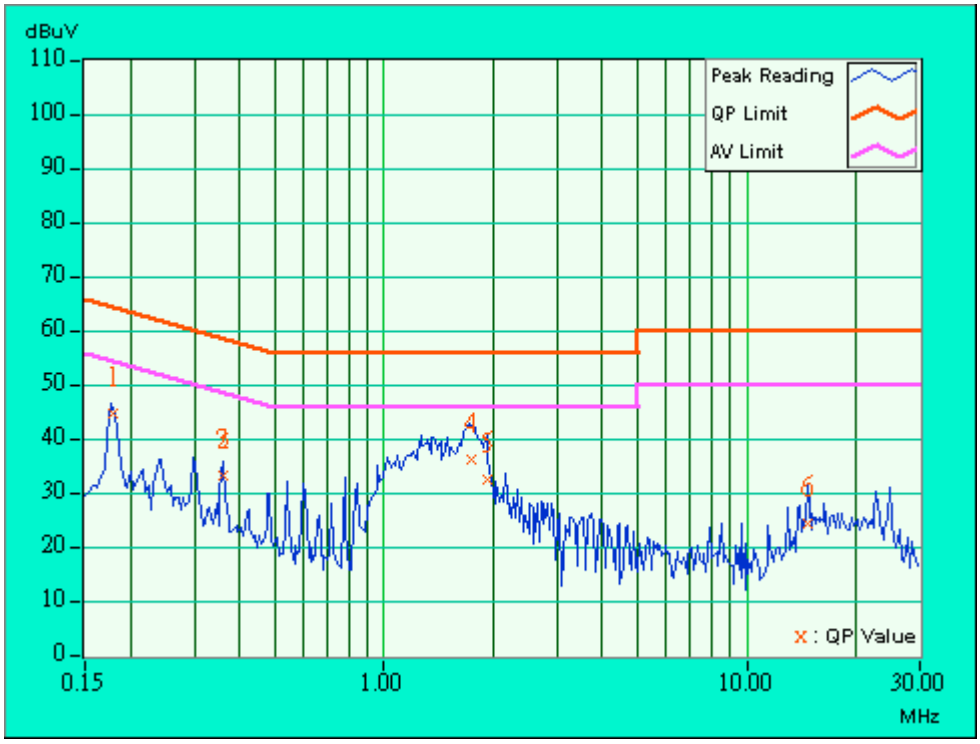
Same as 4.1.6.

## 5.1.7 TEST RESULTS

| | | | |
|---|---|---|---|
| **EUT** | Symbol Wireless Networker 802.11a/g PCI Adapter | | |
| **MODEL** | LA-5033 | **6dB BANDWIDTH** | 9 kHz |
| **INPUT POWER (SYSTEM)** | 120Vac, 60 Hz | **PHASE** | Line (L) |
| **ENVIRONMENTAL CONDITIONS** | 25deg. C, 50%RH 980 hPa | **TESTED BY** | Eric Lee |

| No | Freq. | Corr. | Reading Value | | Emission Level | | Limit | | Margin | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Factor | [dB (uV)] | | [dB (uV)] | | [dB (uV)] | | (dB) | |
| | [MHz] | (dB) | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 1 | 0.179 | 0.20 | 43.70 | - | 43.90 | - | 64.52 | 54.52 | -20.62 | - |
| 2 | 0.361 | 0.20 | 32.31 | - | 32.51 | - | 58.71 | 48.71 | -26.20 | - |
| 3 | 0.361 | 0.20 | 32.29 | - | 32.49 | - | 58.71 | 48.71 | -26.22 | - |
| 4 | 1.744 | 0.30 | 35.09 | - | 35.39 | - | 56.00 | 46.00 | -20.61 | - |
| 5 | 1.923 | 0.30 | 31.44 | - | 31.74 | - | 56.00 | 46.00 | -24.26 | - |
| 6 | 14.718 | 1.08 | 23.30 | - | 24.38 | - | 60.00 | 50.00 | -35.62 | - |

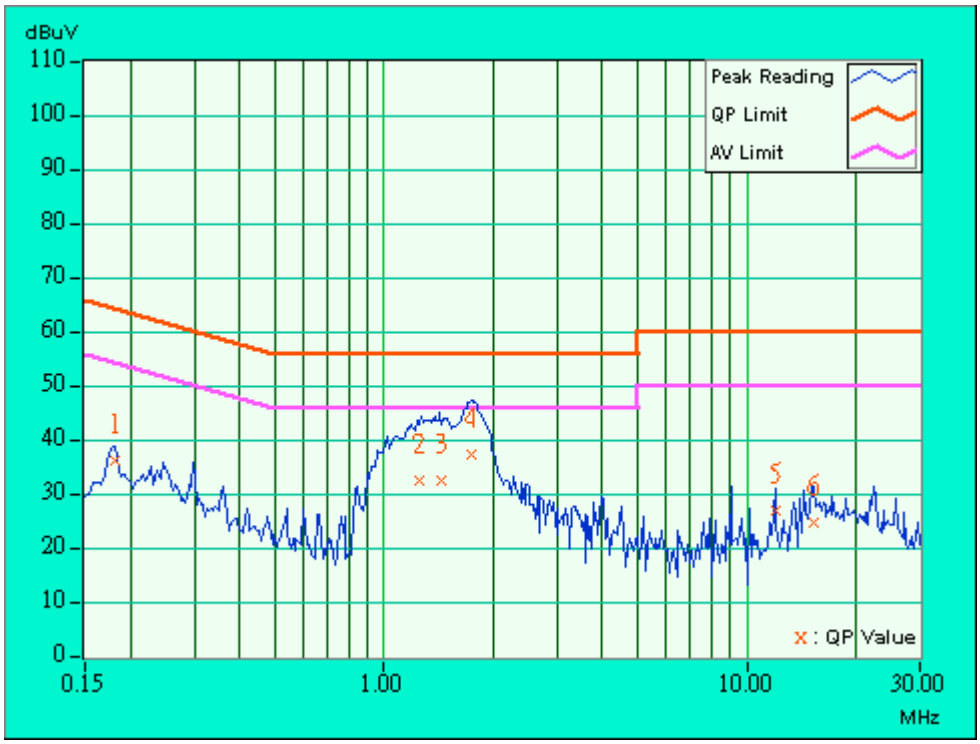
NOTES: (1) "*": Undetectable
(2) Q.P. and AV. are abbreviations of quasi-peak and average.
(3) "-": The Quasi-peak reading value also meets an average limit, thus measurement with the average detector is unnecessary.
(4) The emission levels of other frequencies were very low against the limit.
(5) Correction Factor = Insertion loss + Cable loss
(6) Margin value = Emission level - Limit value



| | | | |
|---|---|---|---|
| **EUT** | Symbol Wireless Networker 802.11a/g PCI Adapter | | |
| **MODEL** | LA-5033 | **6dB BANDWIDTH** | 9 kHz |
| **INPUT POWER (SYSTEM)** | 120Vac, 60 Hz | **PHASE** | Neutral (N) |
| **ENVIRONMENTAL CONDITIONS** | 25deg. C, 50%RH 980 hPa | **TESTED BY** | Eric Lee |

| No | Freq. | Corr. Factor | Reading Value [dB (uV)] | | Emission Level [dB (uV)] | | Limit [dB (uV)] | | Margin (dB) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | [MHz] | (dB) | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 1 | 0.181 | 0.20 | 35.46 | - | 35.66 | - | 64.43 | 54.43 | -28.77 | - |
| 2 | 1.258 | 0.30 | 31.66 | - | 31.96 | - | 56.00 | 46.00 | -24.04 | - |
| 3 | 1.439 | 0.30 | 31.76 | - | 32.06 | - | 56.00 | 46.00 | -23.94 | - |
| **4** | **1.741** | **0.30** | **36.32** | **-** | **36.62** | **-** | **56.00** | **46.00** | **-19.38** | **-** |
| 5 | 11.996 | 0.82 | 26.05 | - | 26.87 | - | 60.00 | 50.00 | -33.13 | - |
| 6 | 15.285 | 1.00 | 23.70 | - | 24.70 | - | 60.00 | 50.00 | -35.30 | - |

NOTES: (1) "*": Undetectable
(2) Q.P. and AV. are abbreviations of quasi-peak and average.
(3) "-": The Quasi-peak reading value also meets an average limit, thus measurement with the average detector is unnecessary.
(4) The emission levels of other frequencies were very low against the limit.
(5) Correction Factor = Insertion loss + Cable loss
(6) Margin value = Emission level - Limit value



## 5.2 RADIATED EMISSION MEASUREMENT

### 5.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

| Frequencies (MHz) | Field strength (microvolts/meter) | Measurement distance (meters) |
|---|---|---|
| 0.009-0.490 | 2400/F(kHz) | 300 |
| 0.490-1.705 | 24000/F(kHz) | 30 |
| 1.705-30.0 | 30 | 30 |
| 30-88 | 100 | 3 |
| 88-216 | 150 | 3 |
| 216-960 | 200 | 3 |
| Above 960 | 500 | 3 |

**NOTE**:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

### 5.2.2 LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS

| **Frequencies (MHz)** | **EIRP Limit (dBm)** | **Equivalent Field Strength at 3m (dBμV/m)** *note 3 |
|---|---|---|
| 5150~5250 | -27 | 68.3 |
| 5250~5350 | -27 | 68.3 |
| 5725~5825 | -27 *note 1 | 68.3 |
| | -17 *note 2 | 78.3 |

**NOTE**:

1. For frequencies 10MHz or greater above or below the band edge.
2. All emissions within the frequency range from the band edge to 10MHz above or below the band edge.
3. The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength

$$E=\frac{1000000\sqrt{30P}}{3} \quad \mu V/m, \quad \text{where P is the eirp (Watts)}$$

### 5.2.3 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED UNTIL |
|---|---|---|---|
| HP Spectrum Analyzer | 8590L | 3467U00646 | Jun. 29, 2004 |
| *ADVANTEST Spectrum Analyzer | R3271A | 85060311 | Jun. 16, 2004 |
| CHASE RF Pre_Amplifier | CPA9232 | 1056 | May 12, 2004 |
| *HP Pre_Amplifier | 8449B | 3008A01922 | Oct. 13, 2004 |
| *ROHDE & SCHWARZ Test Receiver | ESVS 30 | 841977/002 | Sep. 17, 2004 |
| *CHASE Broadband Antenna | CBL6112B | 2798 | Apr. 16, 2004 |
| *Schwarzbeck Horn_Antenna | BBHA9120-D1 | D123 | Sep. 24, 2004 |
| Schwarzbeck Horn_Antenna | BBHA 9170 | BBHA9170192 | Feb. 16, 2005 |
| SCHWARZBECK Tunable Dipole Antenna | UHAP | 897 | Mar. 07, 2005 |
| SCHWARZBECK Tunable Dipole Antenna | VHAP | 880 | Mar. 07, 2005 |
| *RF Switches | MP59B | 1-5161-28698 | Jul. 31, 2004 |
| *RF Cable(CHASE) | CH A9525 | Cable_OB_01 | Jul. 31, 2004 |
| *Software | AS60P8 | NA | NA |
| *CHANCE MOST Antenna Tower | AT-100 | CM-A007 | NA |
| *CHANCE MOST Turn Table | TC-008 | CM-T007 | NA |
| *CORCOM AC Filter | MRI2030 | 024/019 | NA |

Note: 1. The calibration interval of the above test instruments is 12 months (36 months for Tunable Dipole Antenna) and the calibrations are traceable to NML/ROC and NIST/USA.
2. * = These equipment are used for the final measurement.
3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The test was performed in ADT Open Site No. B.
5. The VCCI Site Registration No. is R-847.
6. The FCC Site Registration No. is 92753.
7. The CANADA Site Registration No. is IC 4824-2.

## 5.2.4 TEST PROCEDURES

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

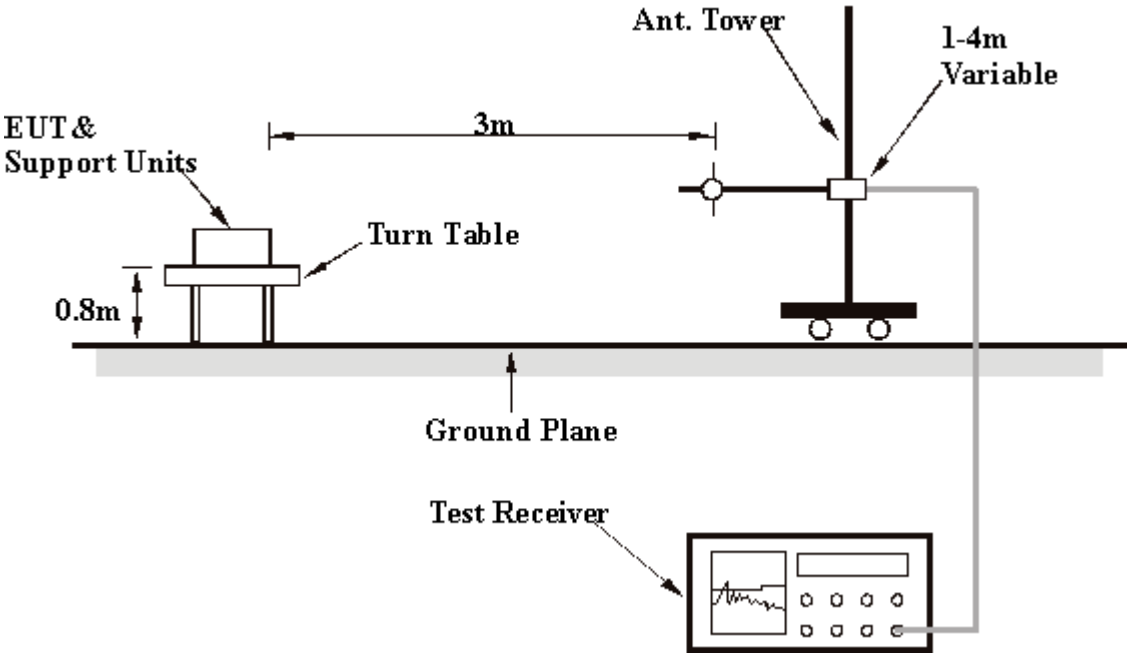
**NOTE:**

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 300 Hz for Average detection (AV) at frequency above 1GHz.

## 5.2.5 DEVIATION FROM TEST STANDARD

No deviation

## 5.2.6 TEST SETUP




For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

## 5.2.7 EUT OPERATING CONDITIONS

Same as 4.1.6.

## 5.2.8 TEST RESULTS

| | | | |
|---|---|---|---|
| **EUT** | Symbol Wireless Networker 802.11a/g PCI Adapter | **MODEL** | LA-5033 |
| **FREQUENCY RANGE** | 30 ~ 1000MHz | **DETECTOR FUNCTION** | Quasi-Peak |
| **ENVIRONMENTAL CONDITIONS** | 25 deg. C, 66%RH, 980 hPa | **INPUT POWER (SYSTEM)** | 120Vac, 60Hz |
| **TESTED BY** | Tony Chen | | |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | 166.38 | 36.10 QP | 43.50 | -7.40 | 1.73 H | 317 | 25.20 | 10.90 |
| 2 | 233.00 | 38.60 QP | 46.00 | -7.40 | 1.22 H | 207 | 27.00 | 11.60 |
| 3 | 299.50 | 32.00 QP | 46.00 | -14.00 | 1.10 H | 220 | 16.30 | 15.70 |
| 4 | 320.00 | 34.00 QP | 46.00 | -12.00 | 1.00 H | 207 | 17.70 | 16.30 |
| 5 | 400.00 | 33.50 QP | 46.00 | -12.50 | 1.00 H | 211 | 15.30 | 18.20 |
| 6 | 480.00 | 29.90 QP | 46.00 | -16.10 | 1.02 H | 209 | 9.30 | 20.60 |
| 7 | 720.08 | 34.40 QP | 46.00 | -11.60 | 1.32 H | 263 | 9.20 | 25.20 |
| 8 | 766.11 | 29.70 QP | 46.00 | -16.30 | 2.04 H | 4 | 2.90 | 26.80 |
| 9 | 768.09 | 38.20 QP | 46.00 | -7.80 | 1.21 H | 234 | 11.50 | 26.70 |
| 10 | 810.01 | 32.30 QP | 46.00 | -13.70 | 1.33 H | 235 | 5.80 | 26.50 |
| 11 | 864.10 | 38.10 QP | 46.00 | -7.90 | 1.22 H | 228 | 10.50 | 27.60 |
| 12 | 912.11 | 34.10 QP | 46.00 | -11.90 | 1.00 H | 78 | 6.30 | 27.80 |

| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | 166.37 | 31.20 QP | 43.50 | -12.30 | 1.10 V | 278 | 20.30 | 10.90 |
| 2 | 232.80 | 32.40 QP | 46.00 | -13.60 | 1.09 V | 241 | 20.80 | 11.60 |
| 3 | 280.00 | 25.20 QP | 46.00 | -20.80 | 1.08 V | 216 | 10.60 | 14.60 |
| 4 | 400.00 | 27.90 QP | 46.00 | -18.10 | 1.07 V | 352 | 9.70 | 18.20 |
| 5 | 480.00 | 28.90 QP | 46.00 | -17.10 | 1.04 V | 263 | 8.30 | 20.60 |
| 6 | 720.08 | 32.50 QP | 46.00 | -13.50 | 1.00 V | 289 | 7.30 | 25.20 |
| 7 | 768.09 | 37.00 QP | 46.00 | -9.00 | 1.03 V | 208 | 10.30 | 26.70 |
| 8 | 810.02 | 32.00 QP | 46.00 | -14.00 | 1.04 V | 212 | 5.50 | 26.50 |
| 9 | 864.10 | 35.40 QP | 46.00 | -10.60 | 1.09 V | 164 | 7.80 | 27.60 |
| 10 | 912.11 | 35.50 QP | 46.00 | -10.50 | 1.23 V | 20 | 7.70 | 27.80 |

**REMARKS**:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.

## 5.2.9 TEST RESULTS

| | | | |
|---|---|---|---|
| **EUT** | Symbol Wireless Networker 802.11a/g PCI Adapter | **MODEL** | LA-5033 |
| **MODE** | Normal Mode | **CHANNEL** | 1 |
| **FREQUENCY RANGE** | 1000MHz~40000MHz | **DETECTOR FUNCTION** | Peak(PK)<br>Average (AV) |
| **ENVIRONMENTAL CONDITIONS** | 24 deg. C, 76%RH, 980 hPa | **INPUT POWER (SYSTEM)** | 120Vac, 60Hz |
| **TESTED BY** | Tony Chen | | |

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
|---|---|---|---|---|---|---|---|---|
| 1 | 2025.00 | 41.50 PK | 68.30 | -26.80 | 1.06 H | 148 | 12.70 | 28.80 |
| 2 | #3606.00 | 47.40 PK | 74.00 | -26.60 | 1.25 H | 68 | 14.20 | 33.20 |
| 3 | #5150.00 | 40.80 PK | 74.00 | -33.20 | 1.37 H | 221 | 3.80 | 37.00 |
| 4 | *5180.00 | 92.20 PK | | | 1.36 H | 216 | 55.20 | 37.00 |
| 4 | *5180.00 | 83.00 AV | | | 1.36 H | 216 | 46.00 | 37.00 |
| 5 | 10360.00 | 53.40 PK | 68.30 | -14.90 | 1.08 H | 360 | 8.70 | 44.70 |
| 6 | #15540.00 | 56.90 PK | 74.00 | -17.10 | 1.21 H | 219 | 8.30 | 48.60 |
| 6 | #15540.00 | 46.90 AV | 54.00 | -7.10 | 1.21 H | 219 | -1.70 | 48.60 |

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
|---|---|---|---|---|---|---|---|---|
| 1 | 2025.00 | 46.20 PK | 68.30 | -22.10 | 1.23 V | 5 | 17.40 | 28.80 |
| 2 | #3606.00 | 48.20 PK | 74.00 | -25.80 | 1.20 V | 201 | 15.00 | 33.20 |
| 3 | #5150.00 | 47.60 PK | 74.00 | -26.40 | 1.20 V | 19 | 10.60 | 37.00 |
| 4 | *5180.00 | 102.40 PK | | | 1.21 V | 14 | 65.40 | 37.00 |
| 4 | *5180.00 | 93.90 AV | | | 1.21 V | 14 | 56.90 | 37.00 |
| 5 | 10360.00 | 53.70 PK | 68.30 | -14.60 | 1.29 V | 114 | 9.00 | 44.70 |
| 6 | #15540.00 | 58.30 PK | 74.00 | -15.70 | 1.18 V | 33 | 9.70 | 48.60 |
| 6 | #15540.00 | 47.40 AV | 54.00 | -6.60 | 1.18 V | 33 | -1.20 | 48.60 |

**NOTE:**

1. Emission level = Raw value + Correction Factor
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. Margin value = Emission level - Limit value
4. The other emission levels were very low against the limit.
5. “*” : Fundamental frequency
6. “# “ : The radiated frequency falling in the restricted band.

| | | | |
|---|---|---|---|
| **EUT** | Symbol Wireless Networker 802.11a/g PCI Adapter | **MODEL** | LA-5033 |
| **MODE** | Normal Mode | **CHANNEL** | 4 |
| **FREQUENCY RANGE** | 1000MHz~40000MHz | **DETECTOR FUNCTION** | Peak(PK)<br>Average (AV) |
| **ENVIRONMENTAL CONDITIONS** | 24 deg. C, 76%RH, 980 hPa | **INPUT POWER (SYSTEM)** | 120Vac, 60Hz |
| **TESTED BY** | Tony Chen | | |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | *5240.00 | 92.40 PK | | | 1.22 H | 67 | 55.40 | 37.00 |
| 1 | *5240.00 | 84.40 AV | | | 1.22 H | 67 | 47.40 | 37.00 |
| 2 | 10480.00 | 53.00 PK | 68.30 | -15.30 | 1.20 H | 55 | 8.00 | 45.00 |
| 3 | #15720.00 | 54.20 PK | 74.00 | -19.80 | 1.15 H | 39 | 6.20 | 48.00 |
| 3 | #15720.00 | 43.60 AV | 54.00 | -10.40 | 1.15 H | 39 | -4.40 | 48.00 |

| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | *5240.00 | 103.70 PK | | | 1.22 V | 65 | 66.70 | 37.00 |
| 1 | *5240.00 | 95.50 AV | | | 1.22 V | 65 | 58.50 | 37.00 |
| 2 | 10480.00 | 54.30 PK | 68.30 | -14.00 | 1.21 V | 59 | 9.30 | 45.00 |
| 3 | #15720.00 | 55.30 PK | 74.00 | -18.70 | 1.17 V | 73 | 7.30 | 48.00 |
| 3 | #15720.00 | 43.70 AV | 54.00 | -10.30 | 1.17 V | 73 | -4.30 | 48.00 |

**NOTE:**

1. Emission level = Raw value + Correction Factor
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. Margin value = Emission level - Limit value
4. The other emission levels were very low against the limit.
5. “*” : Fundamental frequency
6. “# “ : The radiated frequency falling in the restricted band.

| | | | |
|---|---|---|---|
| **EUT** | Symbol Wireless Networker 802.11a/g PCI Adapter | **MODEL** | LA-5033 |
| **MODE** | Normal Mode | **CHANNEL** | 5 |
| **FREQUENCY RANGE** | 1000MHz~40000MHz | **DETECTOR FUNCTION** | Peak (PK)<br>Average (AV) |
| **ENVIRONMENTAL CONDITIONS** | 24 deg. C, 76%RH, 980 hPa | **INPUT POWER (SYSTEM)** | 120Vac, 60Hz |
| **TESTED BY** | Tony Chen | | |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | *5260.00 | 91.10 PK | | | 1.22 H | 68 | 54.10 | 37.00 |
| 1 | *5260.00 | 83.20 AV | | | 1.22 H | 68 | 46.20 | 37.00 |
| 2 | 10520.00 | 53.30 PK | 68.30 | -15.00 | 1.24 H | 158 | 8.10 | 45.20 |
| 3 | #15780.00 | 55.80 PK | 74.00 | -18.20 | 1.24 H | 156 | 7.90 | 47.90 |
| 3 | #15780.00 | 44.80 AV | 54.00 | -9.20 | 1.24 H | 156 | -3.10 | 47.90 |

| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | *5260.00 | 102.60 PK | | | 1.21 V | 64 | 65.60 | 37.00 |
| 1 | *5260.00 | 94.70 AV | | | 1.21 V | 64 | 57.70 | 37.00 |
| 2 | 10520.00 | 53.50 PK | 68.30 | -14.80 | 1.22 V | 315 | 8.30 | 45.20 |
| 3 | #15780.00 | 56.20 PK | 74.00 | -17.80 | 1.20 V | 176 | 8.30 | 47.90 |
| 3 | #15780.00 | 44.80 AV | 54.00 | -9.20 | 1.20 V | 176 | -3.10 | 47.90 |

**NOTE:**

1. Emission level = Raw value + Correction Factor
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. Margin value = Emission level - Limit value
4. The other emission levels were very low against the limit.
5. “*” : Fundamental frequency
6. “# “ : The radiated frequency falling in the restricted band.

| | | | |
|---|---|---|---|
| **EUT** | Symbol Wireless Networker 802.11a/g PCI Adapter | **MODEL** | LA-5033 |
| **MODE** | Normal Mode | **CHANNEL** | 8 |
| **FREQUENCY RANGE** | 1000MHz~40000MHz | **DETECTOR FUNCTION** | Peak(PK)<br>Average (AV) |
| **ENVIRONMENTAL CONDITIONS** | 24 deg. C, 76%RH, 980 hPa | **INPUT POWER (SYSTEM)** | 120Vac, 60Hz |
| **TESTED BY** | Tony Chen | | |

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
|---|---|---|---|---|---|---|---|---|
| 1 | 2025.00 | 41.20 PK | 68.30 | -27.10 | 1.01 H | 244 | 12.40 | 28.80 |
| 2 | #3606.00 | 49.40 PK | 74.00 | -24.60 | 1.30 H | 351 | 16.20 | 33.20 |
| 3 | *5320.00 | 93.60 PK | | | 1.38 H | 213 | 56.60 | 37.00 |
| 3 | *5320.00 | 85.00 AV | | | 1.38 H | 213 | 48.00 | 37.00 |
| 4 | #5350.00 | 42.40 PK | 74.00 | -31.60 | 1.39 H | 200 | 5.40 | 37.00 |
| 5 | #10640.00 | 53.70 PK | 74.00 | -20.30 | 1.25 H | 334 | 7.40 | 46.30 |
| 5 | #10640.00 | 44.70 AV | 54.00 | -9.30 | 1.25 H | 334 | -1.60 | 46.30 |
| 6 | #15960.00 | 55.10 PK | 74.00 | -18.90 | 1.05 H | 25 | 7.80 | 47.30 |
| 6 | #15960.00 | 46.30 AV | 54.00 | -7.70 | 1.05 H | 25 | -1.00 | 47.30 |

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
|---|---|---|---|---|---|---|---|---|
| 1 | 2025.00 | 46.30 PK | 68.30 | -22.00 | 1.15 V | 337 | 17.50 | 28.80 |
| 2 | #3606.00 | 47.10 PK | 74.00 | -26.90 | 1.07 V | 336 | 13.90 | 33.20 |
| 3 | *5320.00 | 105.90 PK | | | 1.30 V | 360 | 68.90 | 37.00 |
| 3 | *5320.00 | 97.00 AV | | | 1.30 V | 360 | 60.00 | 37.00 |
| 4 | #5350.00 | 54.60 PK | 74.00 | -19.40 | 1.35 V | 355 | 17.60 | 37.00 |
| 4 | #5350.00 | 46.20 AV | 54.00 | -7.80 | 1.35 V | 355 | 9.20 | 37.00 |
| 5 | #10640.00 | 53.40 PK | 74.00 | -20.60 | 1.35 V | 353 | 7.10 | 46.30 |
| 5 | #10640.00 | 43.40 AV | 54.00 | -10.60 | 1.35 V | 353 | -2.90 | 46.30 |
| 6 | #15960.00 | 56.50 PK | 74.00 | -17.50 | 1.15 V | 337 | 9.20 | 47.30 |
| 6 | #15960.00 | 46.30 AV | 54.00 | -7.70 | 1.15 V | 337 | -1.00 | 47.30 |

**NOTE:**

1. Emission level = Raw value + Correction Factor
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. Margin value = Emission level - Limit value
4. The other emission levels were very low against the limit.
5. “*” : Fundamental frequency
6. “# “ : The radiated frequency falling in the restricted band.

| | | | |
|---|---|---|---|
| **EUT** | Symbol Wireless Networker 802.11a/g PCI Adapter | **MODEL** | LA-5033 |
| **MODE** | Normal Mode | **CHANNEL** | 9 |
| **FREQUENCY RANGE** | 1000MHz~40000MHz | **DETECTOR FUNCTION** | Peak(PK)<br>Average (AV) |
| **ENVIRONMENTAL CONDITIONS** | 24 deg. C, 76%RH, 980 hPa | **INPUT POWER (SYSTEM)** | 120Vac, 60Hz |
| **TESTED BY** | Tony Chen | | |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | 5715.00 | 46.30 PK | 68.30 | -22.00 | 1.52 H | 187 | 8.80 | 37.50 |
| 2 | 5725.00 | 52.60 PK | 78.30 | -25.70 | 1.52 H | 198 | 15.10 | 37.50 |
| 3 | *5745.00 | 94.10 PK | | | 1.05 H | 259 | 56.50 | 37.60 |
| 3 | *5745.00 | 85.90 AV | | | 1.05 H | 259 | 48.30 | 37.60 |
| 4 | #11490.00 | 58.40 PK | 74.00 | -15.60 | 1.43 H | 255 | 7.10 | 51.30 |
| **4** | **#11490.00** | **49.20 AV** | **54.00** | **-4.80** | **1.43 H** | **255** | **-2.10** | **51.30** |
| 5 | 17235.00 | 60.20 PK | 68.30 | -8.10 | 1.40 H | 193 | 8.50 | 51.70 |

| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | 5715.00 | 52.70 PK | 68.30 | -15.60 | 1.34 V | 2 | 15.20 | 37.50 |
| 2 | 5725.00 | 64.50 PK | 78.30 | -13.80 | 1.35 V | 0 | 27.00 | 37.50 |
| 3 | *5745.00 | 104.40 PK | | | 1.41 V | 0 | 66.80 | 37.60 |
| 3 | *5745.00 | 96.10 AV | | | 1.41 V | 0 | 58.50 | 37.60 |
| 4 | #11490.00 | 59.00 PK | 74.00 | -15.00 | 1.39 V | 89 | 7.70 | 51.30 |
| 4 | #11490.00 | 47.90 AV | 54.00 | -6.10 | 1.39 V | 89 | -3.40 | 51.30 |
| 5 | 17235.00 | 61.30 PK | 68.30 | -7.00 | 1.32 V | 140 | 9.60 | 51.70 |

**NOTE:**

1. Emission level = Raw value + Correction Factor
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. Margin value = Emission level - Limit value
4. The other emission levels were very low against the limit.
5. “*” : Fundamental frequency
6. “# “ : The radiated frequency falling in the restricted band.

| | | | |
|---|---|---|---|
| **EUT** | Symbol Wireless Networker 802.11a/g PCI Adapter | **MODEL** | LA-5033 |
| **MODE** | Normal Mode | **CHANNEL** | 12 |
| **FREQUENCY RANGE** | 1000MHz~40000MHz | **DETECTOR FUNCTION** | Peak(PK)<br>Average (AV) |
| **ENVIRONMENTAL CONDITIONS** | 24 deg. C, 76%RH, 980 hPa | **INPUT POWER (SYSTEM)** | 120Vac, 60Hz |
| **TESTED BY** | Tony Chen | | |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | *5805.00 | 91.70 PK | | | 1.34 H | 209 | 54.00 | 37.70 |
| 1 | *5805.00 | 84.50 AV | | | 1.34 H | 209 | 46.80 | 37.70 |
| 2 | 5825.00 | 51.10 PK | 78.30 | -27.20 | 1.35 H | 201 | 13.40 | 37.70 |
| 3 | 5835.00 | 45.10 PK | 68.30 | -23.20 | 1.36 H | 222 | 7.40 | 37.70 |
| 4 | #11610.00 | 58.00 PK | 74.00 | -16.00 | 1.22 H | 301 | 7.00 | 51.00 |
| 4 | #11610.00 | 48.70 AV | 54.00 | -5.30 | 1.22 H | 301 | -2.30 | 51.00 |
| 5 | 17415.00 | 62.10 PK | 68.30 | -6.20 | 1.02 H | 25 | 8.50 | 53.60 |

| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | *5805.00 | 102.50 PK | | | 1.57 V | 38 | 64.80 | 37.70 |
| 1 | *5805.00 | 94.50 AV | | | 1.57 V | 38 | 56.80 | 37.70 |
| 2 | 5825.00 | 63.20 PK | 78.30 | -15.10 | 1.53 V | 358 | 25.50 | 37.70 |
| 3 | 5835.00 | 51.10 PK | 68.30 | -17.20 | 1.53 V | 357 | 13.40 | 37.70 |
| 4 | #11610.00 | 59.10 PK | 74.00 | -14.90 | 1.35 V | 38 | 8.10 | 51.00 |
| 4 | #11610.00 | 48.40 AV | 54.00 | -5.60 | 1.35 V | 38 | -2.60 | 51.00 |
| 5 | 17415.00 | 62.70 PK | 68.30 | -5.60 | 1.25 V | 330 | 9.10 | 53.60 |

**NOTE:**

1. Emission level = Raw value + Correction Factor
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. Margin value = Emission level - Limit value
4. The other emission levels were very low against the limit.
5. “*” : Fundamental frequency
6. “# “ : The radiated frequency falling in the restricted band.

## 5.3 PEAK TRANSMIT POWER MEASUREMENT

### 5.3.1 LIMITS OF PEAK TRANSMIT POWER MEASUREMENT

| Frequency Band | Limit |
|---|---|
| 5.15 – 5.25 GHz | The lesser of 50mW (17dBm) or 4dBm + 10logB |
| 5.25 – 5.35 GHz | The lesser of 250mW (24dBm) or 11dBm + 10logB |
| 5.725 – 5.825 GHz | The lesser of 1W (30dBm) or 17dBm + 10logB |

**Note:** Where B is the 26dB emission bandwidth in MHz.

### 5.3.2 TEST INSTRUMENTS

| Description & Manufacturer | Model No. | Serial No. | Calibrated Until |
|---|---|---|---|
| R&S SPECTRUM ANALYZER | FSP40 | 100037 | May. 06, 2004 |

**NOTE:**
The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

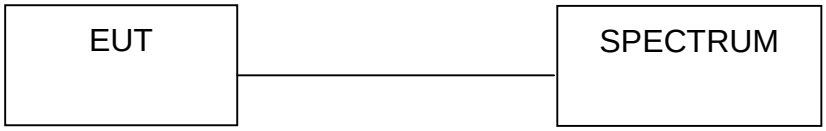
### 5.3.3 TEST PROCEDURE

1. The transmitter output was connected to the spectrum analyzer.
2. Set span to encompass the entire emission bandwidth of the signal.
3. Set RBW to 1MHz, VBW to 30kHz.
4. Using the spectrum analyzer's channel power measurement function to measure the output power.

### 5.3.4 DEVIATION FROM TEST STANDARD

No deviation

### 5.3.5 TEST SETUP




### 5.3.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.

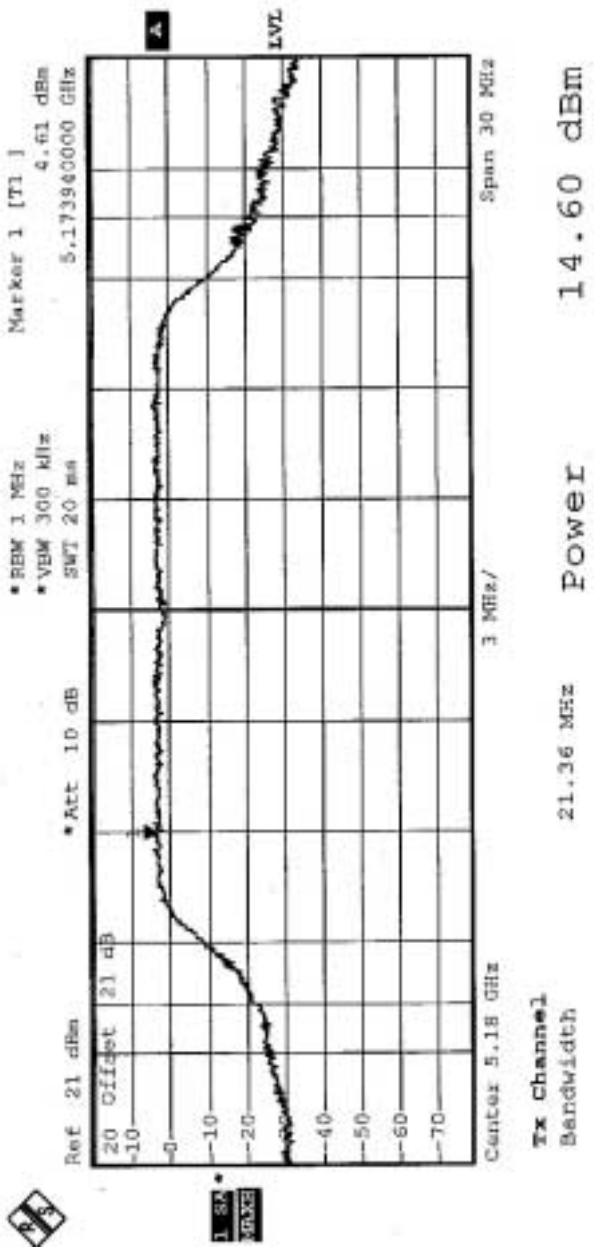
### 5.3.7 TEST RESULTS

| | | | |
|---|---|---|---|
| **EUT** | Symbol Wireless Networker 802.11a/g PCI Adapter | **MODEL** | LA-5033 |
| **MODE** | Normal | **INPUT POWER (SYSTEM)** | 120Vac, 60 Hz |
| **ENVIRONMENTAL CONDITIONS** | 24eg. C, 76RH, 980 hPa | **TESTED BY** | Tony Chen |

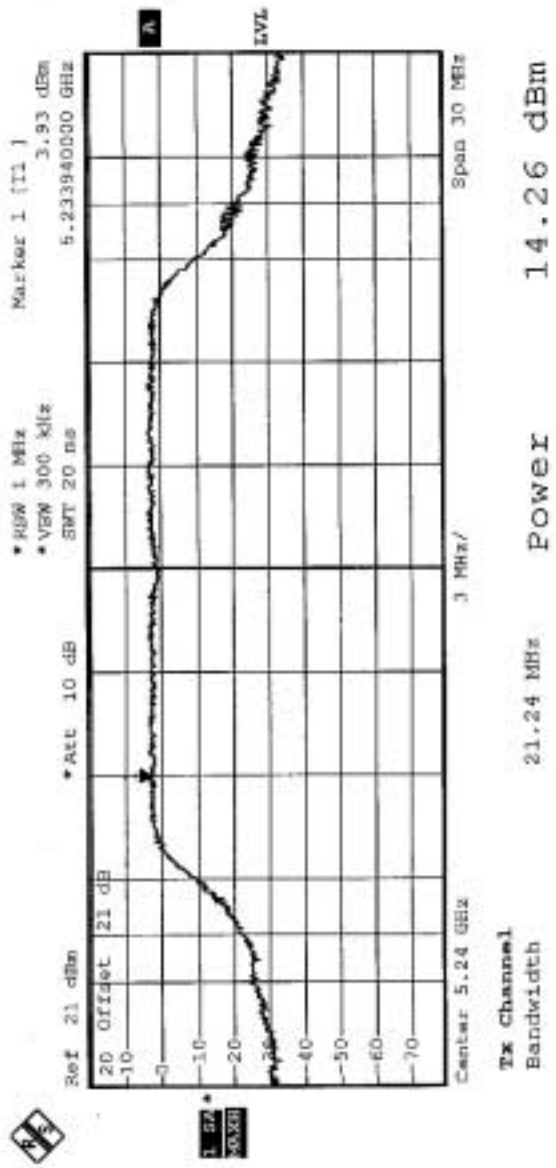
| CHANNEL | CHANNEL FREQUENCY (MHz) | PEAK POWER OUTPUT (dBm) | PEAK POWER LIMIT (dBm) | 26dBc Occupied Bandwidth (MHz) | PASS/FAIL |
|---|---|---|---|---|---|
| 1 | 5180 | 14.60 | 17.00 | 21.36 | PASS |
| 4 | 5240 | 14.26 | 17.00 | 21.24 | PASS |
| 5 | 5260 | 14.09 | 24.00 | 21.18 | PASS |
| 8 | 5320 | 14.71 | 24.00 | 21.48 | PASS |
| 9 | 5745 | 14.84 | 30.00 | 21.48 | PASS |
| 12 | 5805 | 14.66 | 30.00 | 21.48 | PASS |

**NOTE:** The 26dBc Occupied Bandwidth plot, please refer to the following pages.

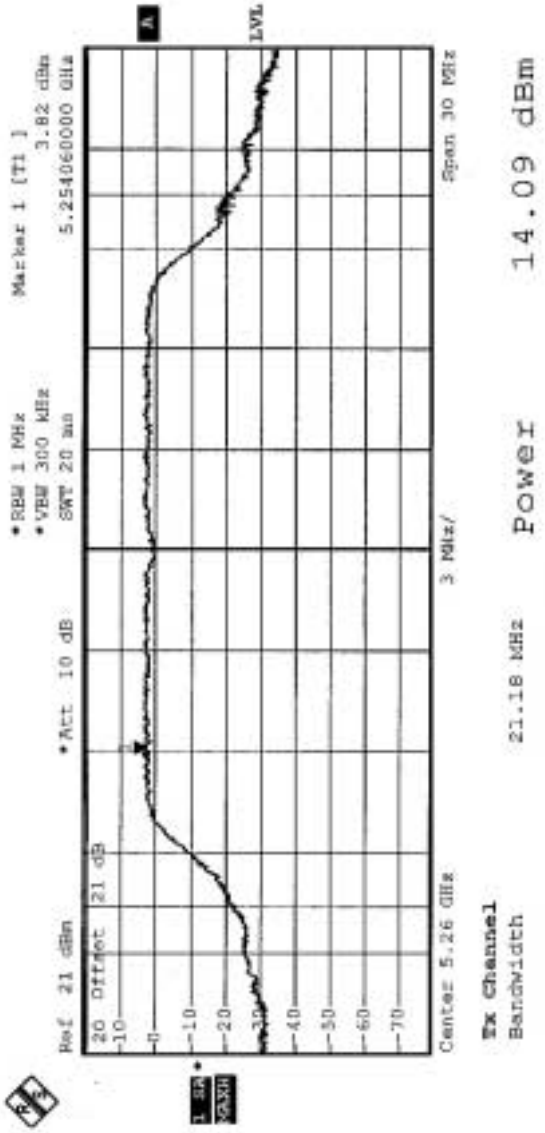
CHANNEL 1


Ref 21 dBm
Att 10 dB
RBW 1 MHz
VBW 300 kHz
SWT 20 ms
Marker 1 [T1 ]
4.61 dBm
5.173960000 GHz
20 Offset 21 dB
10
0
-10
-20
-30
-40
-50
-60
-70
Center 5.18 GHz
3 MHz/
Span 30 MHz
LVL
Tx channel
Bandwidth
21.36 MHz
Power
14.60 dBm

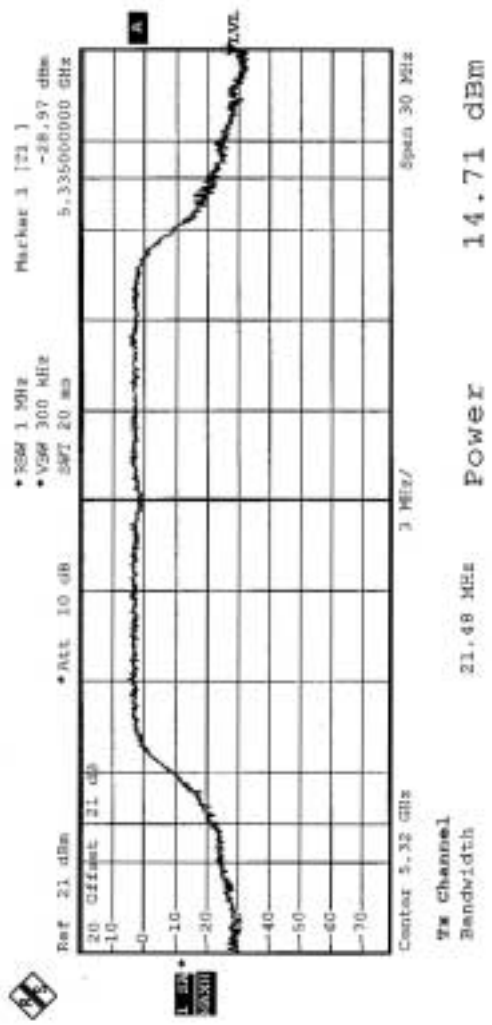
CHANNEL 4


Ref 21 dBm
Att 10 dB
RBW 1 MHz
VBW 300 kHz
SWT 20 ms
Marker 1 [T1 ]
3.93 dBm
5.233940000 GHz
20 Offset 21 dB
Center 5.24 GHz
3 MHz/
Span 30 MHz
Tx Channel
Bandwidth
21.24 MHz
Power
14.26 dBm

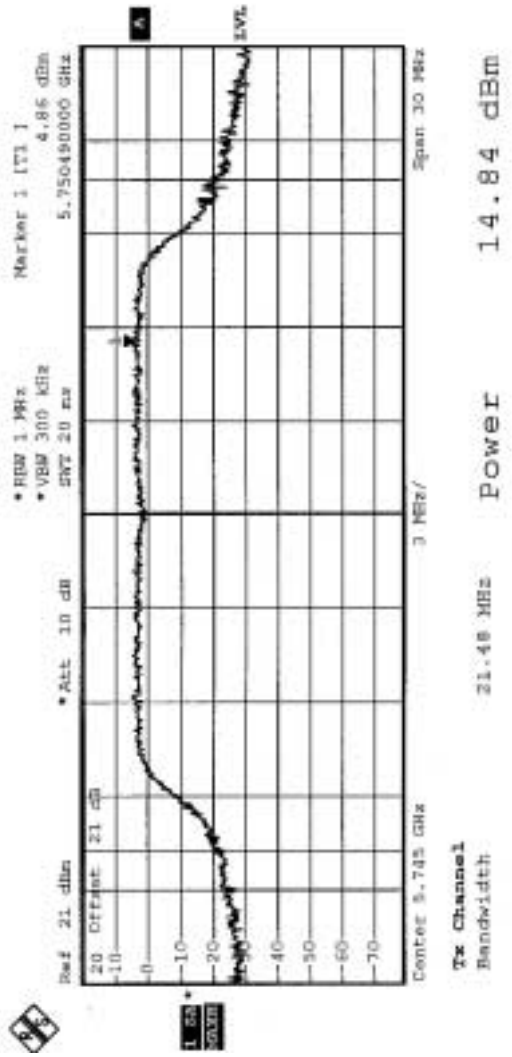
CHANNEL 5


Ref 21 dBm
Offset 21 dB
Att 10 dB
RBW 1 MHz
VBW 300 kHz
SWT 20 ms
Marker 1 [T1 ]
3.82 dBm
5.254060000 GHz
Center 5.26 GHz
3 MHz/
Span 30 MHz
Tx Channel
Bandwidth
21.18 MHz
Power
14.09 dBm
LVL

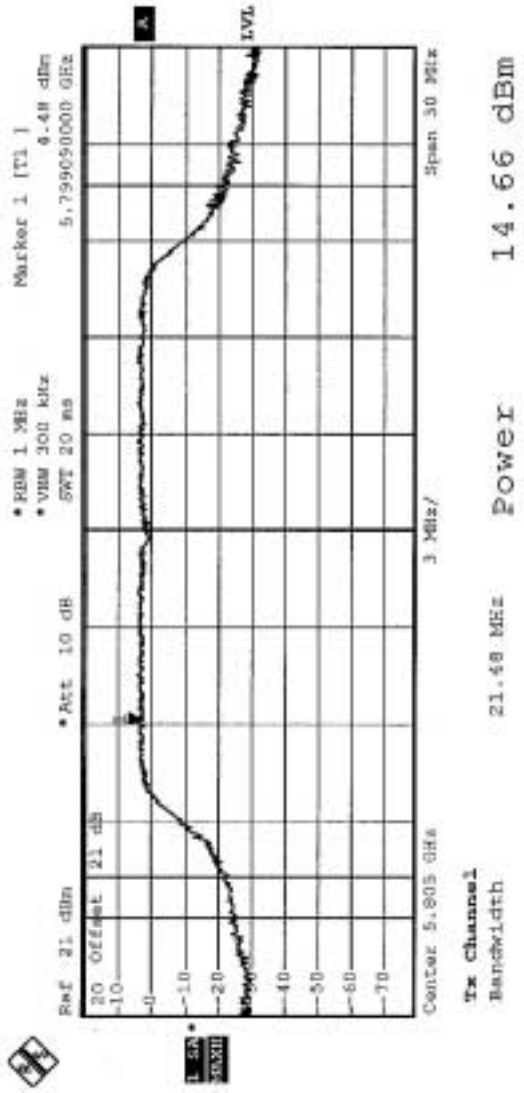
CHANNEL 8


Ref 21 dBm
Offset 21 dB
Att 10 dB
RBW 1 MHz
VBW 300 kHz
SWT 20 ms
Marker 1 [T1 ]
-28.97 dBm
5.335000000 GHz
Center 5.32 GHz
3 MHz/
Span 30 MHz
Tx Channel
Bandwidth
21.48 MHz
Power
14.71 dBm

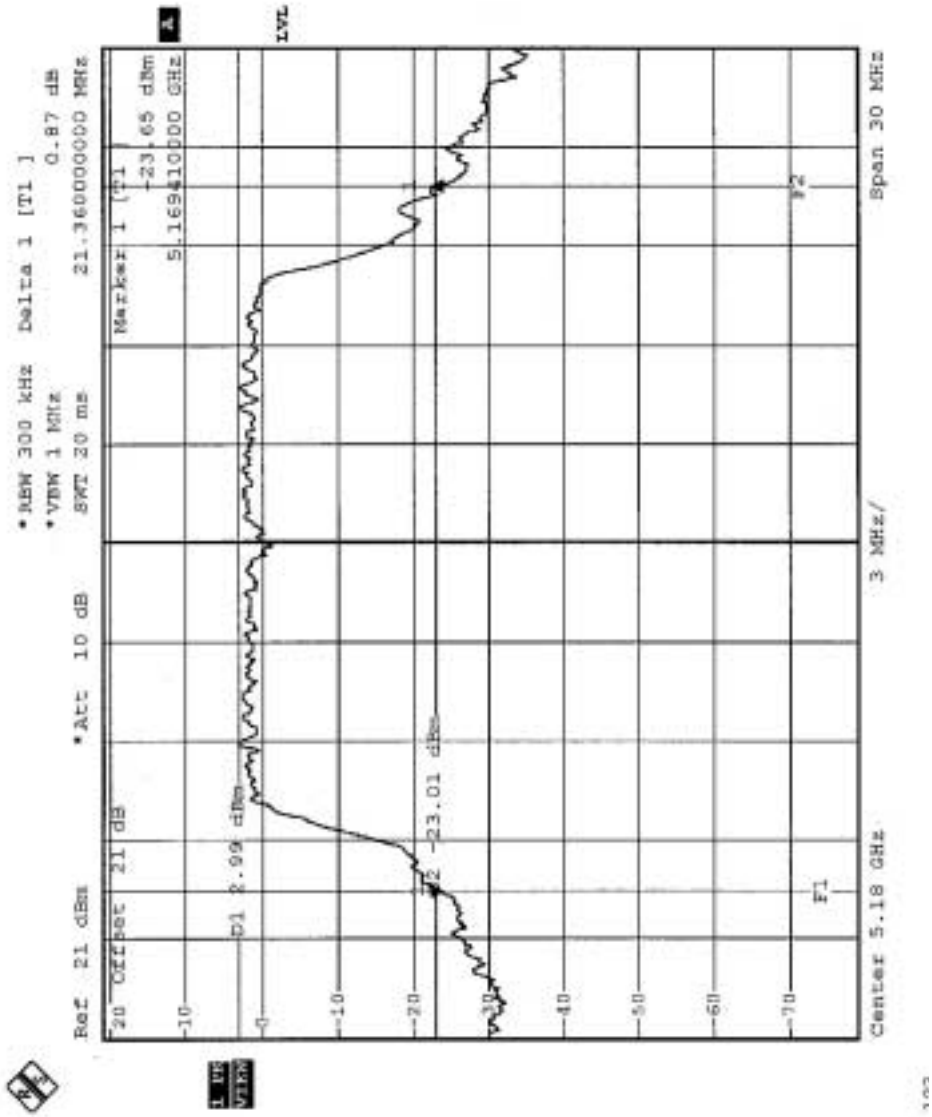
CHANNEL 9


Ref 21 dBm
Offset 21 dB
*Att 10 dB
*RBW 1 MHz
*VBW 300 kHz
SWT 20 ms
Marker 1 [T1 ]
4.86 dBm
5.750490000 GHz
Center 5.745 GHz
3 MHz/
Span 30 MHz
Tx Channel
Bandwidth
21.40 MHz
Power
14.84 dBm

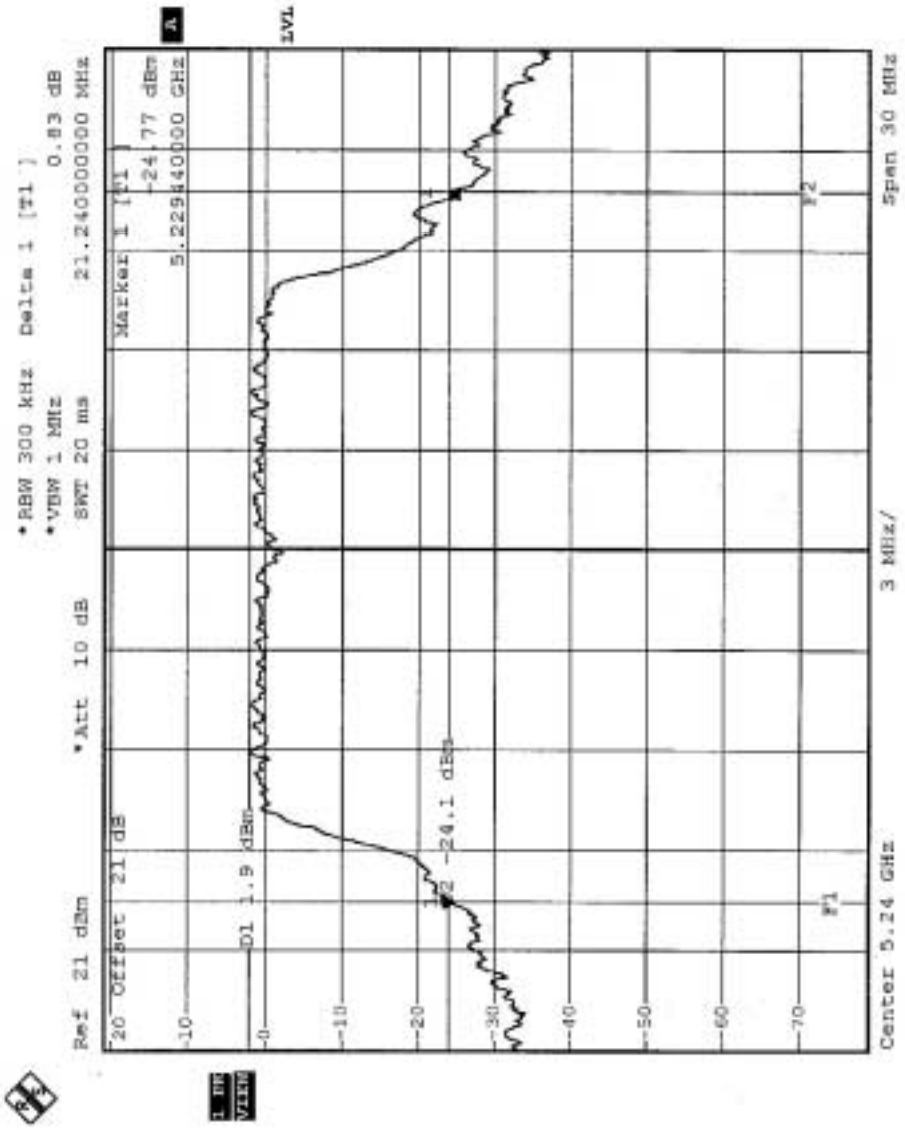
CHANNEL 12


Ref 21 dBm
Offset 21 dB
Att 10 dB
RBW 1 MHz
VBW 300 kHz
SWT 20 ms
Marker 1 [T1 ]
-4.48 dBm
5.799050000 GHz
Center 5.805 GHz
3 MHz/
Span 30 MHz
Tx Channel
Bandwidth
21.48 MHz
Power
14.66 dBm

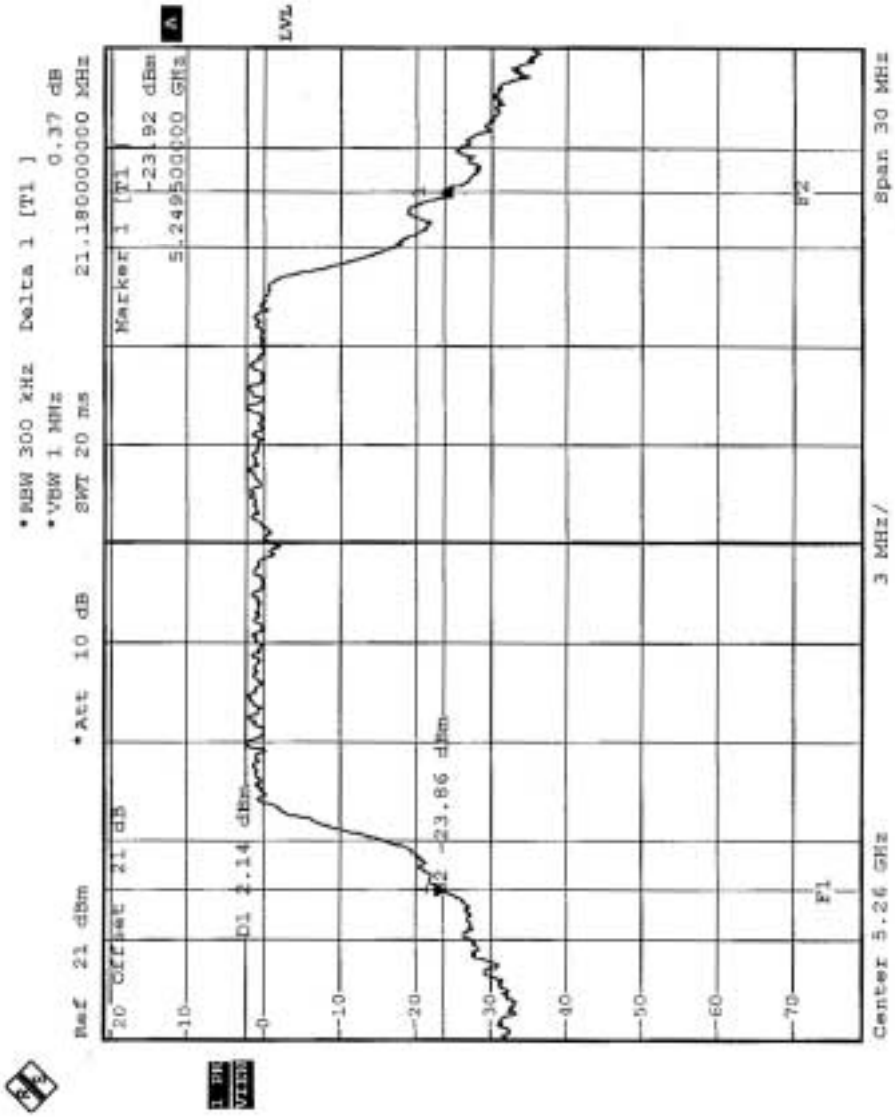
CHANNEL 1


Ref 21 dBm
Att 10 dB
RBW 300 kHz
VBW 1 MHz
SWT 20 ms
Delta 1 [T1 ]
0.87 dB
21.36000000 MHz
Marker 1 [T1 ]
-23.65 dBm
5.169410000 GHz
D1 2.99 dBm
-23.01 dBm
Center 5.18 GHz
3 MHz/
Span 30 MHz

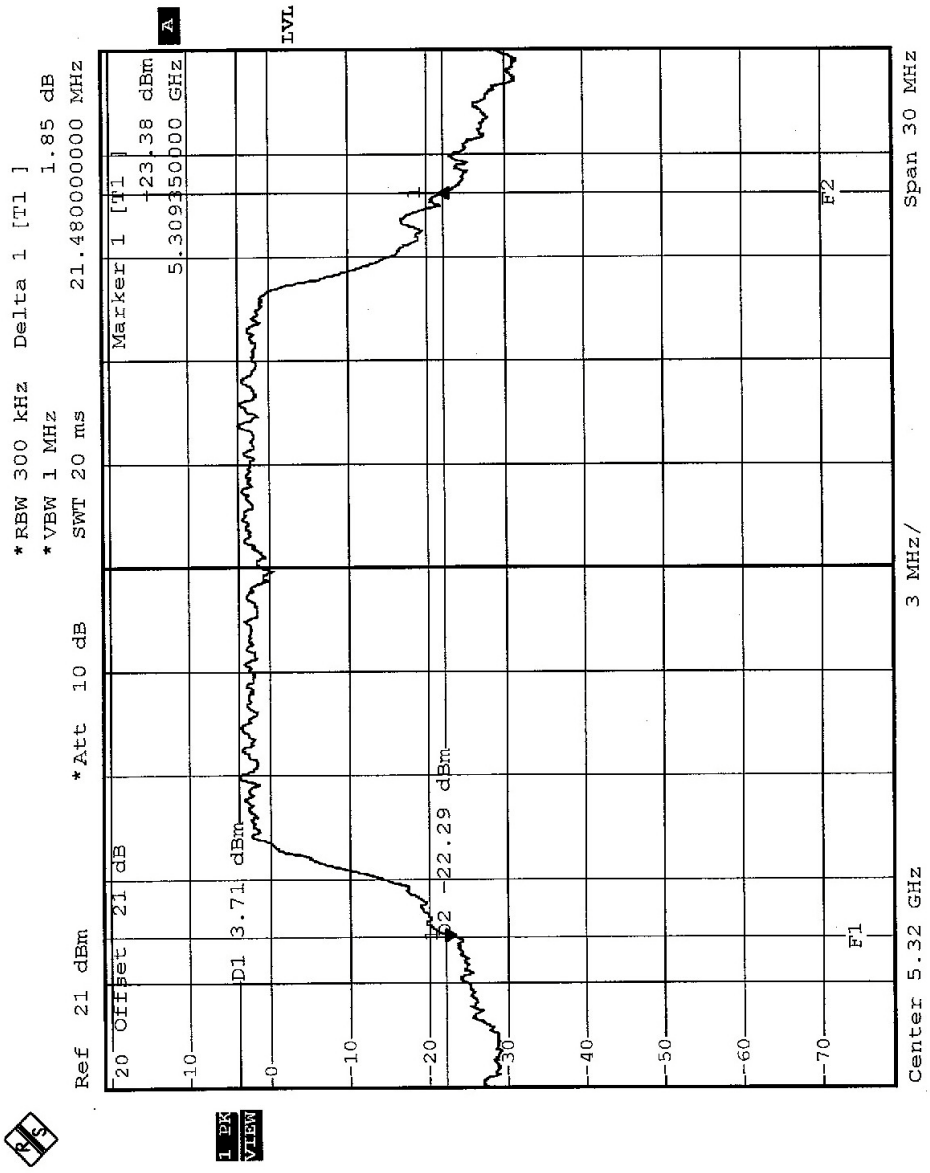
CHANNEL 4


Ref 21 dBm
Att 10 dB
RBW 300 kHz
VBW 1 MHz
SWT 20 ms
Delta 1 [T1 ]
0.83 dB
21.24000000 MHz
Marker 1 [T1 ]
-24.77 dBm
5.229440000 GHz
D1 1.9 dBm
-24.1 dBm
Center 5.24 GHz
3 MHz/
Span 30 MHz

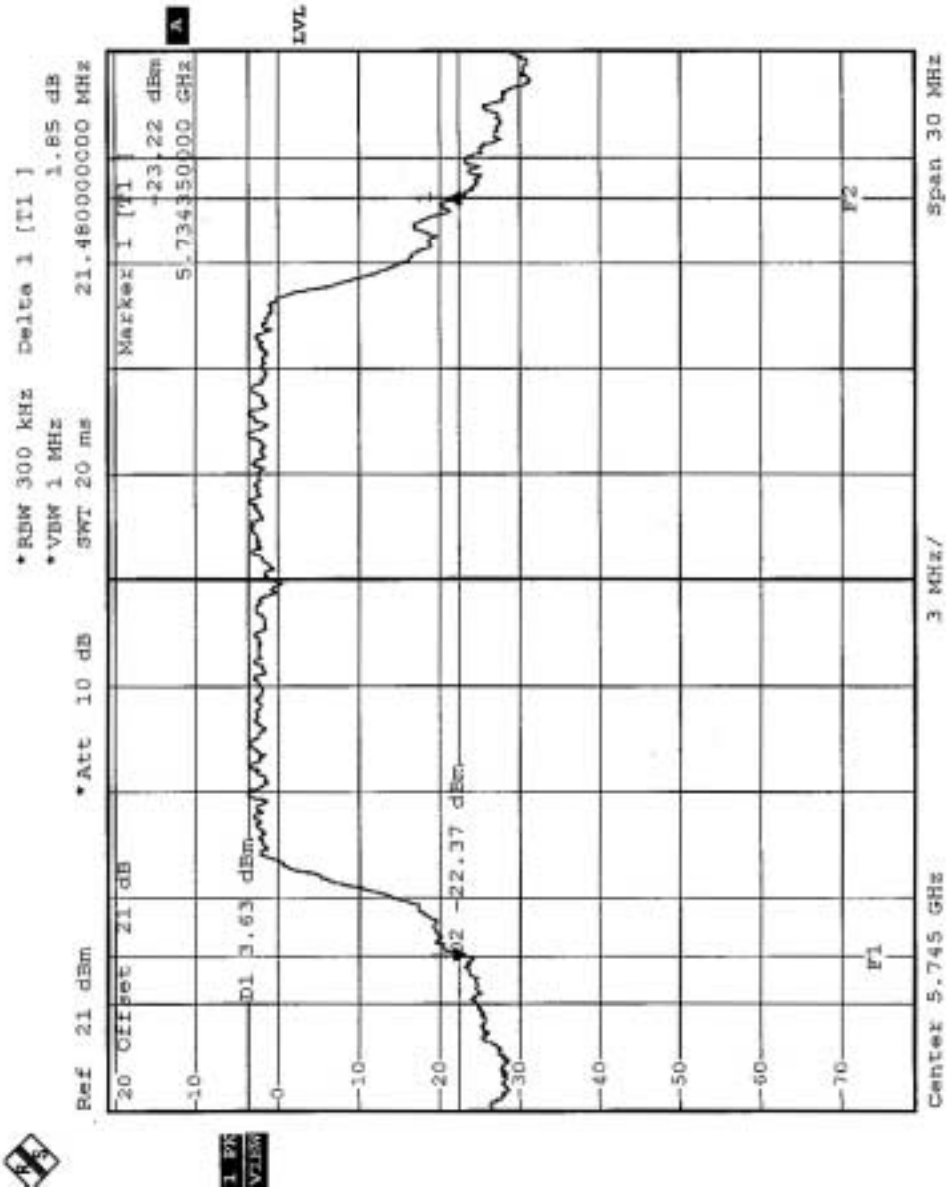
CHANNEL 5


Ref 21 dBm
Att 10 dB
RBW 300 kHz
VBW 1 MHz
SWT 20 ms
Delta 1 [T1 ]
0.37 dB
21.180000000 MHz
Marker 1 [T1 ]
-23.92 dBm
5.249500000 GHz
D1 2.14 dBm
-23.86 dBm
LVL
Center 5.26 GHz
3 MHz/
Span 30 MHz

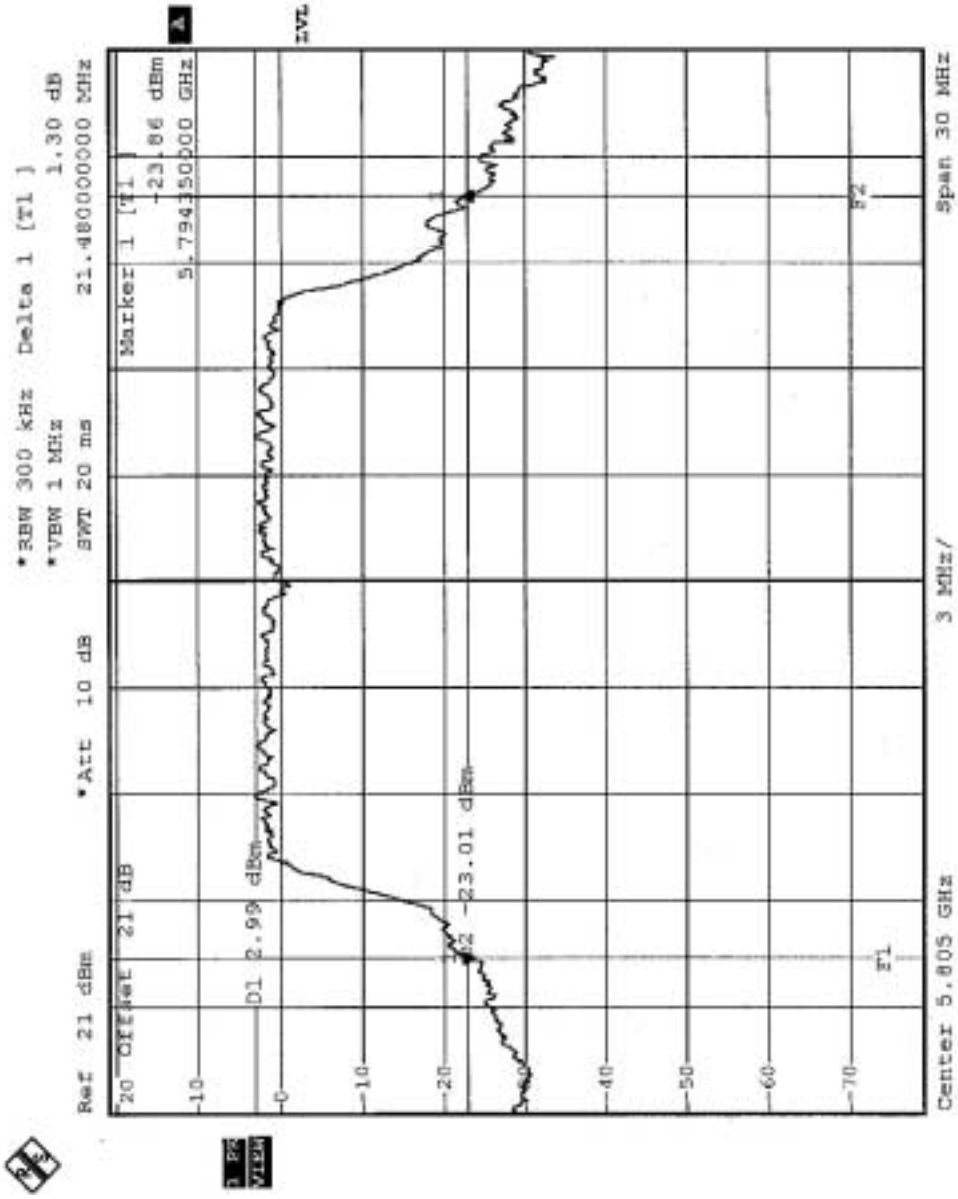
CHANNEL 8


Ref 21 dBm
*Att 10 dB
*RBW 300 kHz
*VBW 1 MHz
SWT 20 ms
Delta 1 [T1 ]
1.85 dB
21.480000000 MHz
Marker 1 [T1 ]
-23.38 dBm
5.309350000 GHz
Offset 21 dB
D1 3.71 dBm
D2 -22.29 dBm
F1
F2
Center 5.32 GHz
3 MHz/
Span 30 MHz
1 PK
VIEW
LVL
A

CHANNEL9


Ref 21 dBm
Offset 21 dB
*Att 10 dB
*RBW 300 kHz
*VBW 1 MHz
SWT 20 ms
Delta 1 [T1 ]
1.85 dB
21.48000000 MHz
Marker 1 [T1 ]
-23.22 dBm
5.734350000 GHz
D1 3.63 dBm
D2 -22.37 dBm
LVL
Center 5.745 GHz
3 MHz/
Span 30 MHz

CHANNEL 12


Ref 21 dBm
Att 10 dB
SWT 20 ms
RBW 300 kHz
VBW 1 MHz
Delta 1 [T1 ]
1.30 dB
21.48000000 MHz
Marker 1 [T1 ]
-23.86 dBm
5.794350000 GHz
D1 2.99 dBm
-23.01 dBm
Center 5.805 GHz
3 MHz/
Span 30 MHz

## 5.4 PEAK POWER EXCURSION MEASUREMENT

### 5.4.1 LIMITS OF PEAK POWER EXCURSION MEASUREMENT

| Frequency Band | Limit |
|---|---|
| 5.15 – 5.25 GHz | 13dB |
| 5.25 – 5.35 GHz | 13dB |
| 5.725 – 5.825 GHz | 13dB |

### 5.4.2 TEST INSTRUMENTS

| Description & Manufacturer | Model No. | Serial No. | Calibrated Until |
|---|---|---|---|
| R&S SPECTRUM ANALYZER | FSP40 | 100037 | May. 06, 2004 |

**NOTE:**
The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

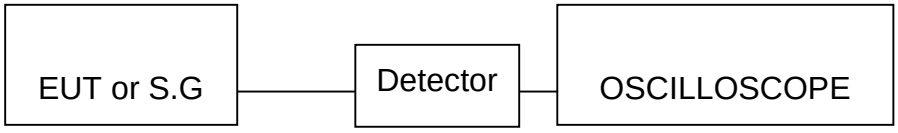
### 5.4.3 TEST PROCEDURE

1. The transmitter output was connected to the spectrum analyzer.
2. Set the spectrum bandwidth span to view the entire spectrum.
3. Using peak detector and Max-hold function for Trace 1 (RB=1MHz, VB=3MHz) and 2 (RB=1MHz, VB=30KHz).
4. The largest difference between Trace 1 and Trace 2 in any 1MHz band on any frequency was recorded.

### 5.4.4 DEVIATION FROM TEST STANDARD

No deviation

### 5.4.5 TEST SETUP




### 5.4.6 EUT OPERATING CONDITIONS

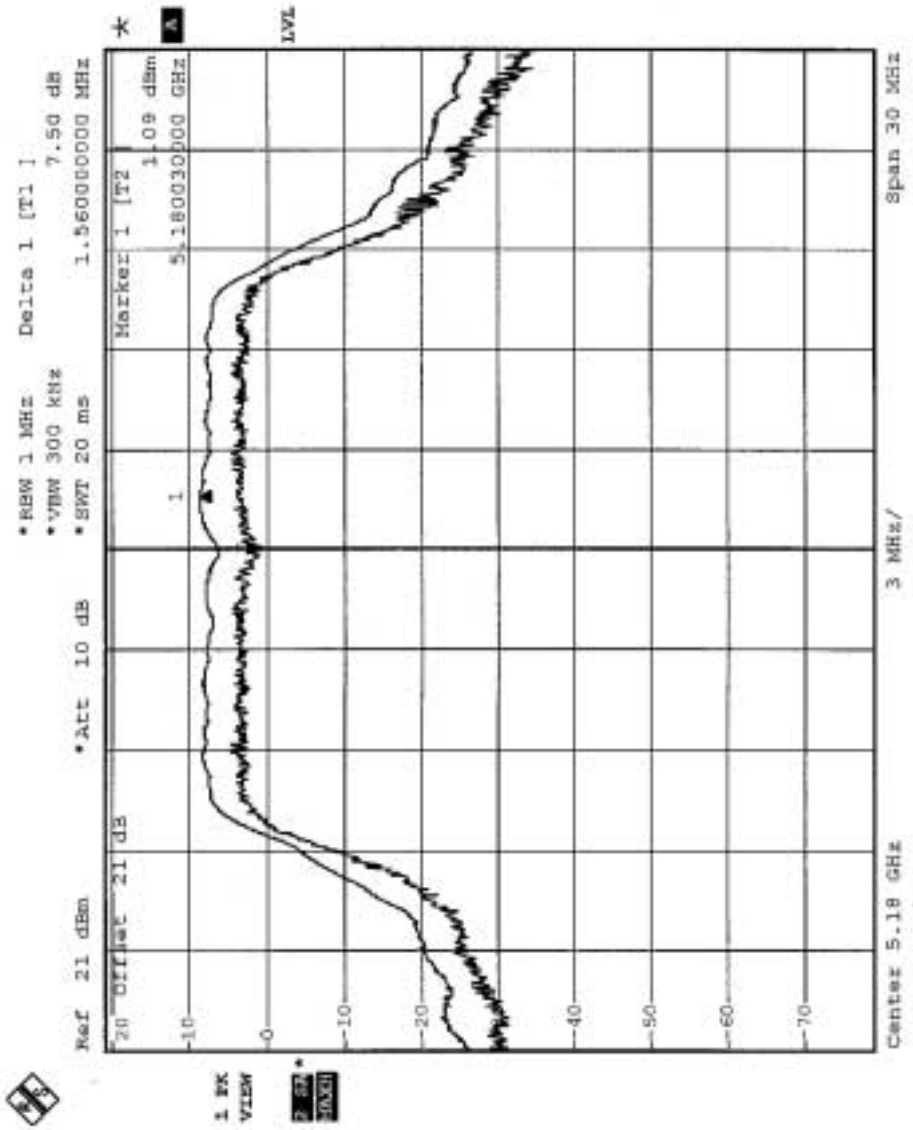
The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.

## 5.4.7 TEST RESULTS

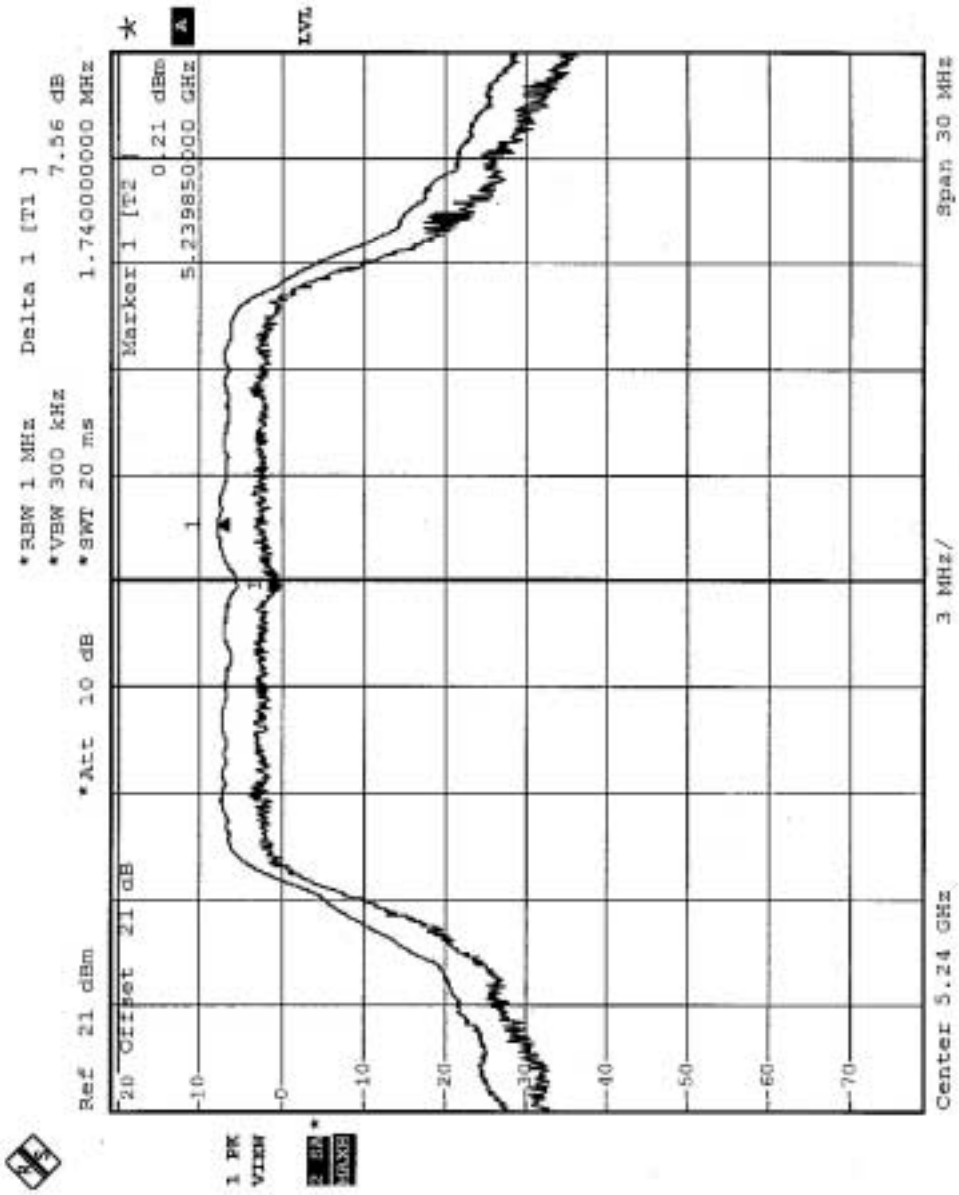
| | | | |
|---|---|---|---|
| **EUT** | Symbol Wireless Networker 802.11a/g PCI Adapter | **MODEL** | LA-5033 |
| **MODE** | Normal | **INPUT POWER (SYSTEM)** | 120Vac, 60 Hz |
| **ENVIRONMENTAL CONDITIONS** | 24eg. C, 76RH, 980 hPa | **TESTED BY** | Tony Chen |

| CHANNEL | CHANNEL FREQUENCY (MHz) | PEAK POWER EXCURSION (dB) | PEAK to AVERAGE EXCURSION LIMIT (dB) | PASS/FAIL |
|---|---|---|---|---|
| 1 | 5180 | 7.50 | 13 | PASS |
| 4 | 5240 | 7.56 | 13 | PASS |
| 5 | 5260 | 7.19 | 13 | PASS |
| 8 | 5320 | 7.06 | 13 | PASS |
| 9 | 5745 | 6.58 | 13 | PASS |
| 12 | 5805 | 6.63 | 13 | PASS |

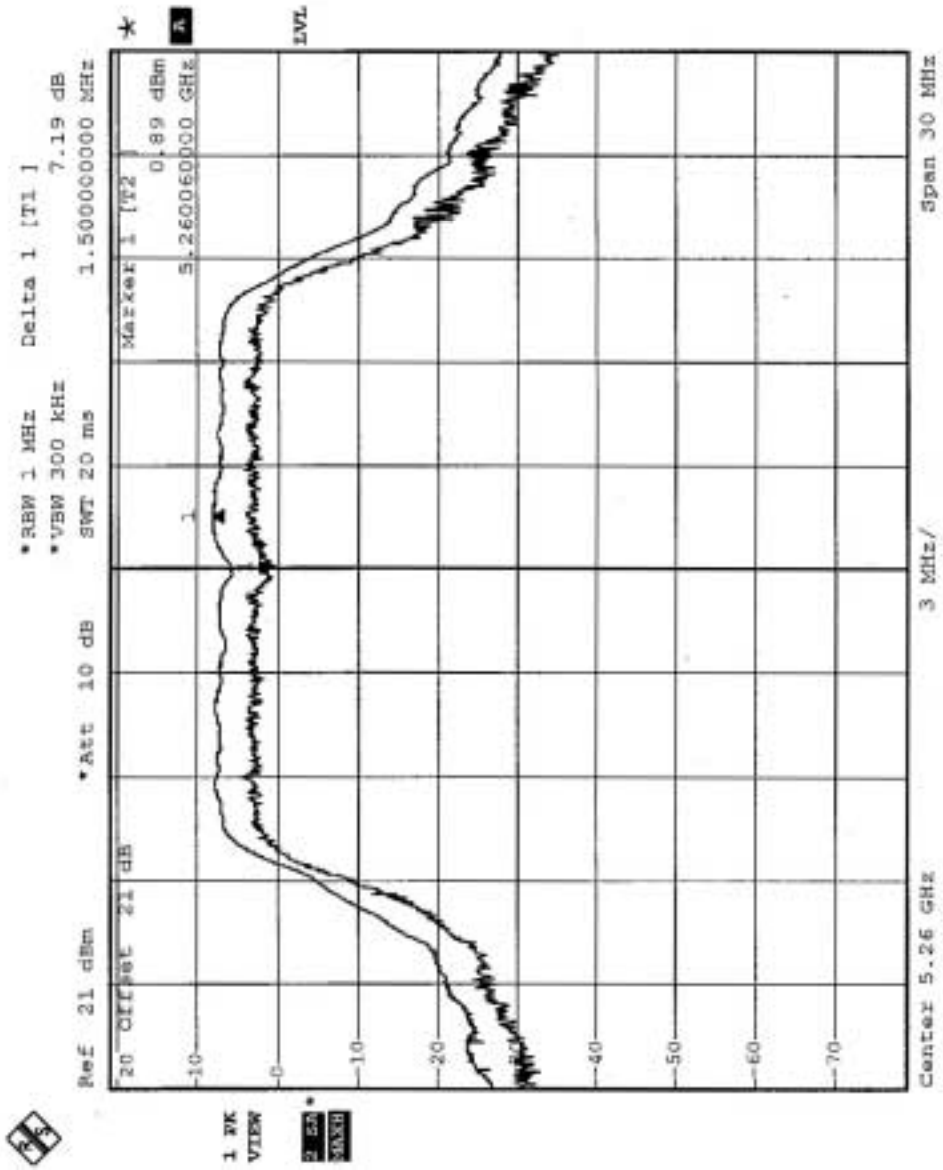
CHANNEL 1


Ref 21 dBm
Att 10 dB
RBW 1 MHz
VBW 300 kHz
SWT 20 ms
Delta 1 [T1 ]
7.50 dB
1.560000000 MHz
Marker 1 [T2 ]
1.09 dBm
5.180030000 GHz
Center 5.18 GHz
3 MHz/
Span 30 MHz
1 PK
VIEW
LVL

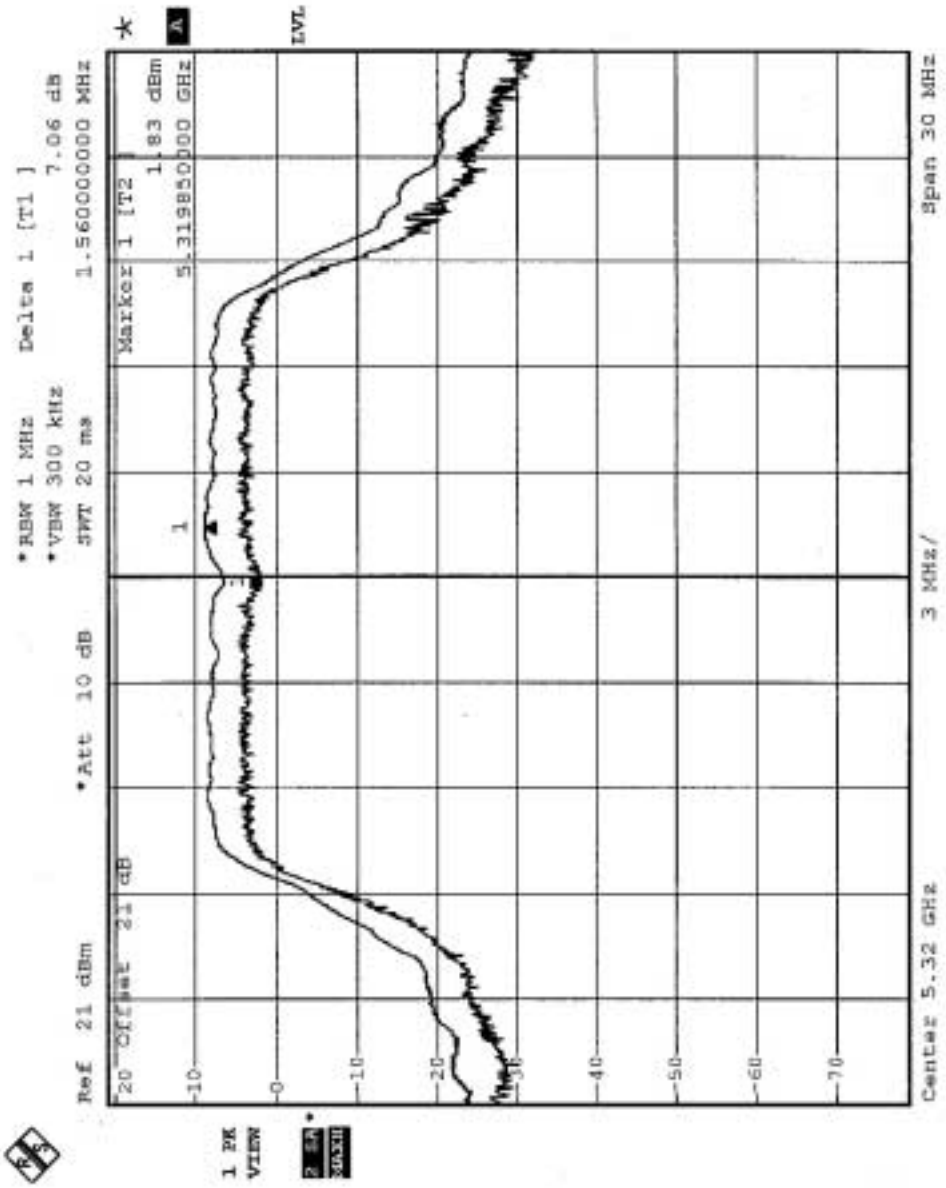
CHANNEL 4


Ref 21 dBm
Offset 21 dB
*Att 10 dB
*RBW 1 MHz
*VBW 300 kHz
*SWT 20 ms
Delta 1 [T1 ]
7.56 dB
1.74000000 MHz
Marker 1 [T2
0.21 dBm
5.23985000 GHz
1 PK
VIEW
Center 5.24 GHz
3 MHz/
Span 30 MHz

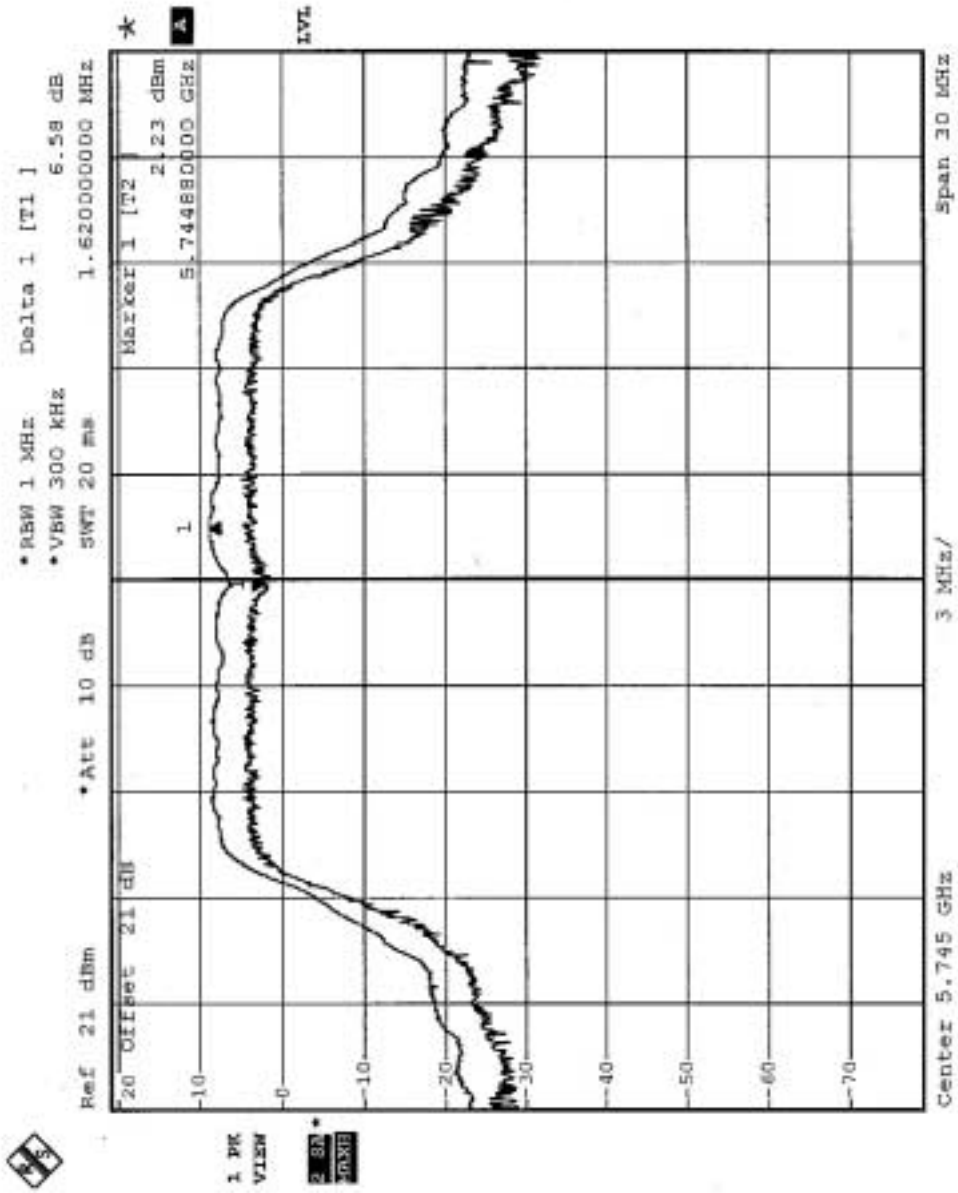
CHANNEL 5


Ref 21 dBm
Att 10 dB
RBW 1 MHz
VBW 300 kHz
SWT 20 ms
Delta 1 [T1 ]
7.19 dB
1.50000000 MHz
Marker 1 [T2 ]
0.89 dBm
5.26060000 GHz
Center 5.26 GHz
3 MHz/
Span 30 MHz

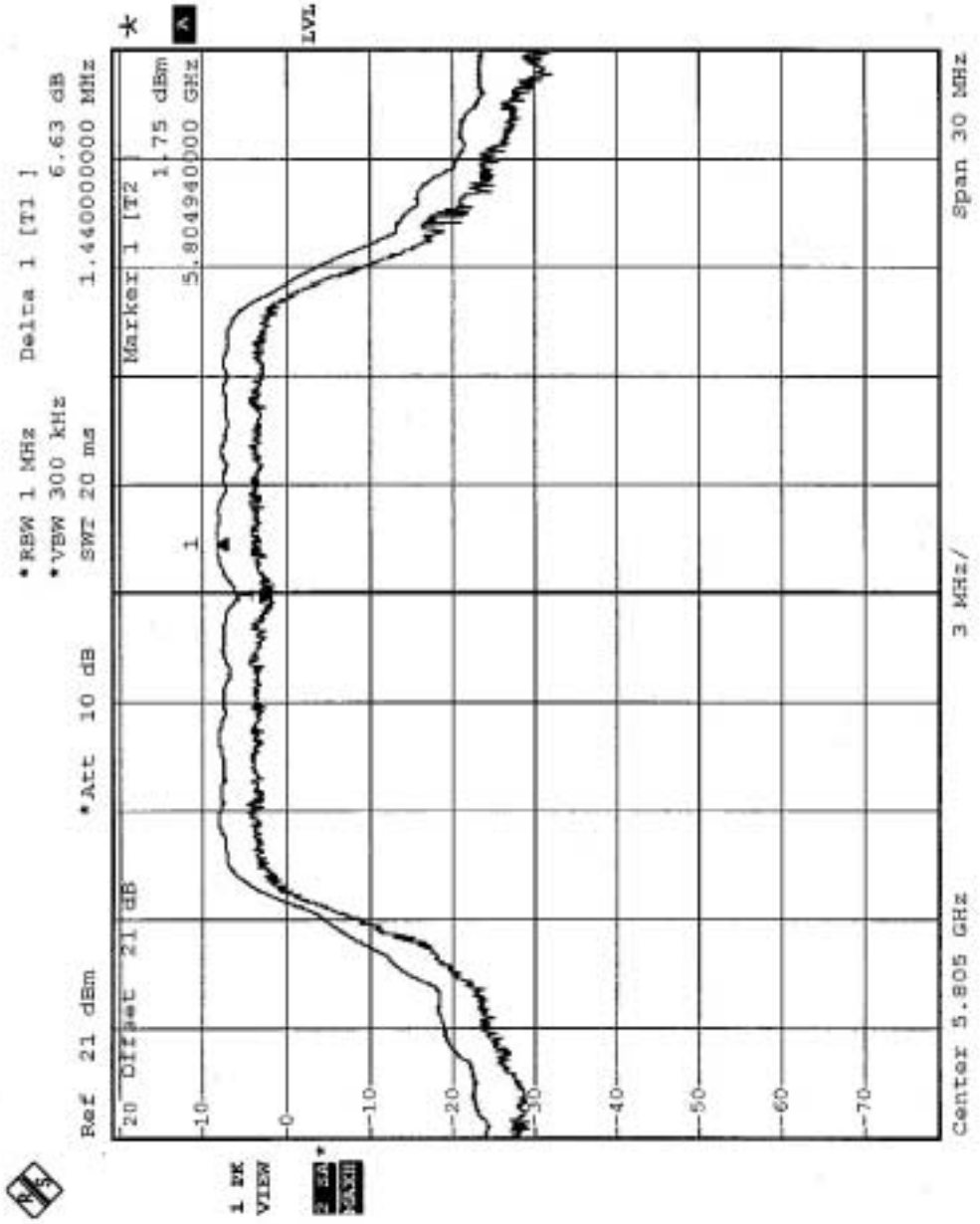
CHANNEL 8


Ref 21 dBm
Offset 21 dB
*Att 10 dB
*RBW 1 MHz
*VBW 300 kHz
SWT 20 ms
Delta 1 [T1 ]
7.06 dB
1.56000000 MHz
Marker 1 [T2 ]
1.83 dBm
5.31985000 GHz
1 PK
VIEW
LVL
Center 5.32 GHz
3 MHz/
Span 30 MHz

CHANNEL 9


Ref 21 dBm
Offset 21 dB
*Att 10 dB
*RBW 1 MHz
*VBW 300 kHz
SWT 20 ms
Delta 1 [T1 ]
6.58 dB
1.62000000 MHz
Marker 1 [T2
2.23 dBm
5.74480000 GHz
1 PK
VIEW
LVL
Center 5.745 GHz
3 MHz/
Span 30 MHz

CHANNEL 12


Ref 21 dBm
Offset 21 dB
*Att 10 dB
*RBW 1 MHz
*VBW 300 kHz
SWT 20 ms
Delta 1 [T1 ]
6.63 dB
1.440000000 MHz
Marker 1 [T2 ]
1.75 dBm
5.804940000 GHz
LVL
Center 5.805 GHz
3 MHz/
Span 30 MHz
1 PK VIEW
2 SA MAXH

## 5.5 PEAK POWER SPECTRAL DENSITY MEASUREMENT

### 5.5.1 LIMITS OF PEAK POWER SPECTRAL DENSITY MEASUREMENT

| Frequency Band | Limit |
|---|---|
| 5.15 – 5.25 GHz | 4dBm |
| 5.25 – 5.35 GHz | 11dBm |
| 5.725 – 5.825 GHz | 17dBm |

### 5.5.2 TEST INSTRUMENTS

| Description & Manufacturer | Model No. | Serial No. | Calibrated Until |
|---|---|---|---|
| R&S SPECTRUM ANALYZER | FSP40 | 100037 | May. 06, 2004 |

**NOTE:**
The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

### 5.5.3 TEST PROCEDURES

1. The transmitter output was connected to the spectrum analyzer.
2. Set RBW=1MHz, VBW=3MHz. The PPSD is the highest level found across the emission in any 1MHz band.

### 5.5.4 DEVIATION FROM TEST STANDARD

No deviation

### 5.5.5 TEST SETUP

### 5.5.6 EUT OPERATING CONDITIONS

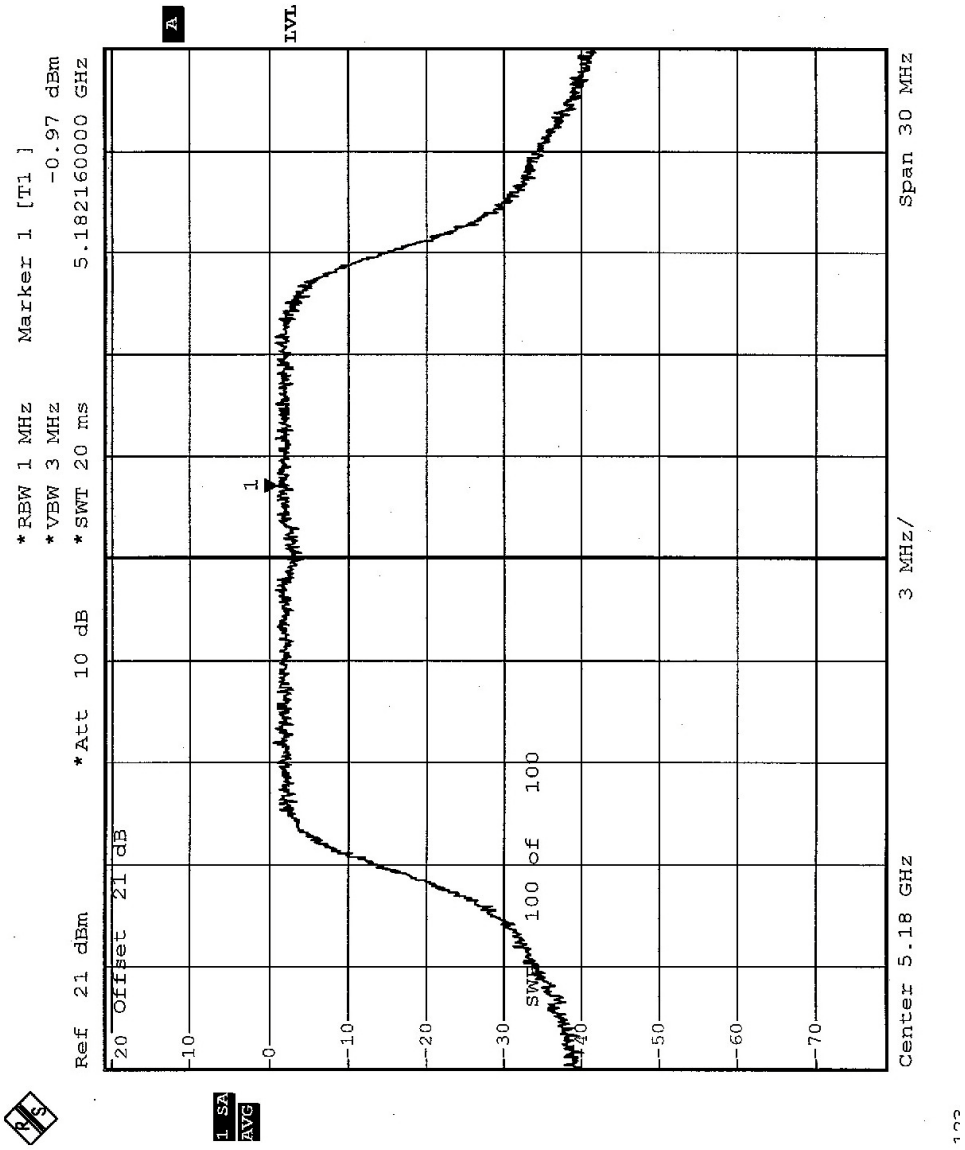
Same as 5.3.6

## 5.5.7 TEST RESULTS

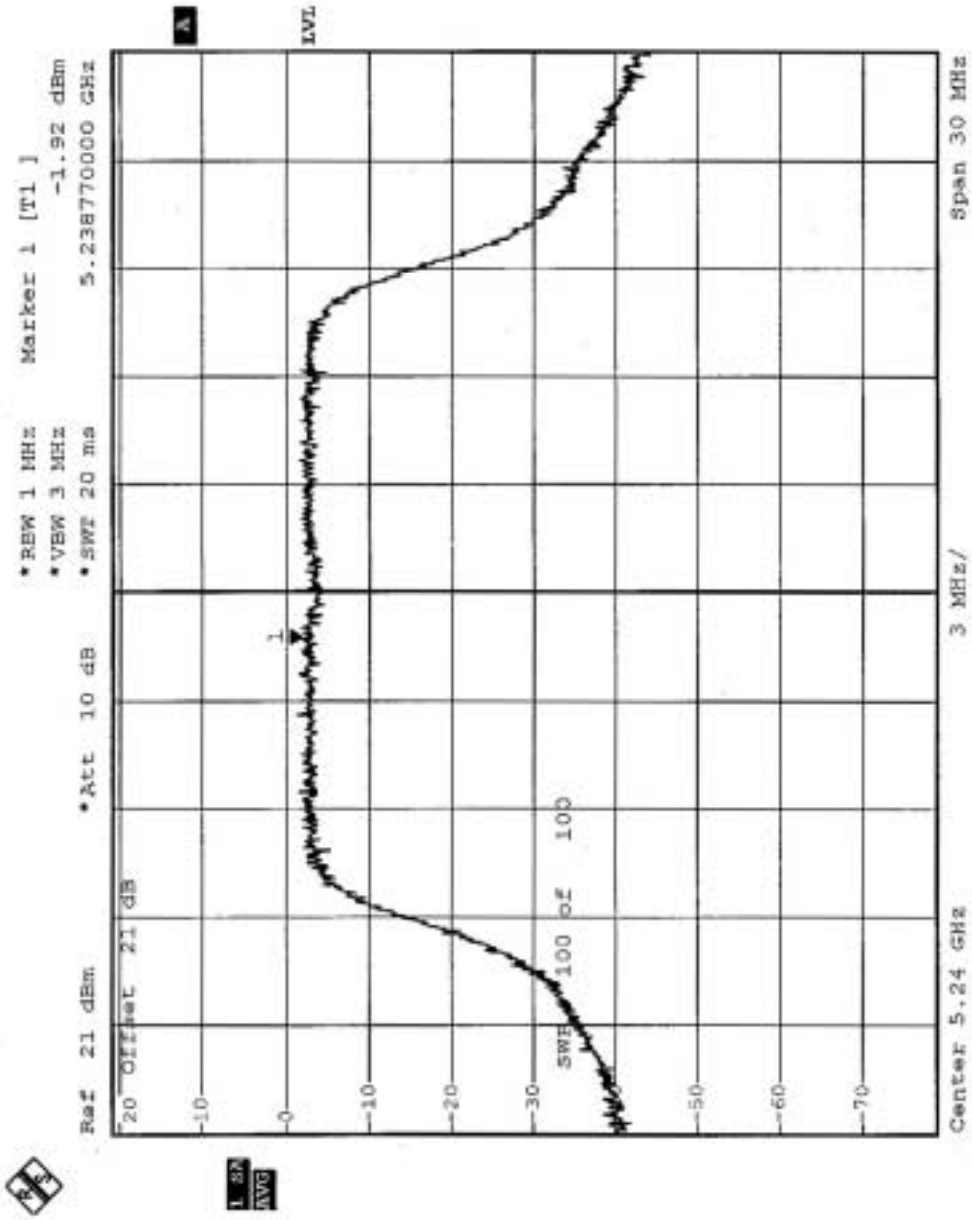
| | | | |
|---|---|---|---|
| **EUT** | Symbol Wireless Networker 802.11a/g PCI Adapter | **MODEL** | LA-5033 |
| **MODE** | Normal | **INPUT POWER (SYSTEM)** | 120Vac, 60 Hz |
| **ENVIRONMENTAL CONDITIONS** | 28eg. C, 56RH, 980 hPa | **TESTED BY** | Tony Chen |

| CHANNEL NUMBER | CHANNEL FREQUENCY (MHz ) | RF POWER LEVEL IN 1 MHz BW (dBm) | MAXIMUM LIMIT (dBm) | PASS/FAIL |
|---|---|---|---|---|
| 1 | 5180 | -0.97 | 4 | PASS |
| 4 | 5240 | -1.92 | 4 | PASS |
| 5 | 5260 | -1.25 | 11 | PASS |
| 8 | 5320 | -0.42 | 11 | PASS |
| 9 | 5745 | -0.12 | 17 | PASS |
| 12 | 5805 | -0.27 | 17 | PASS |

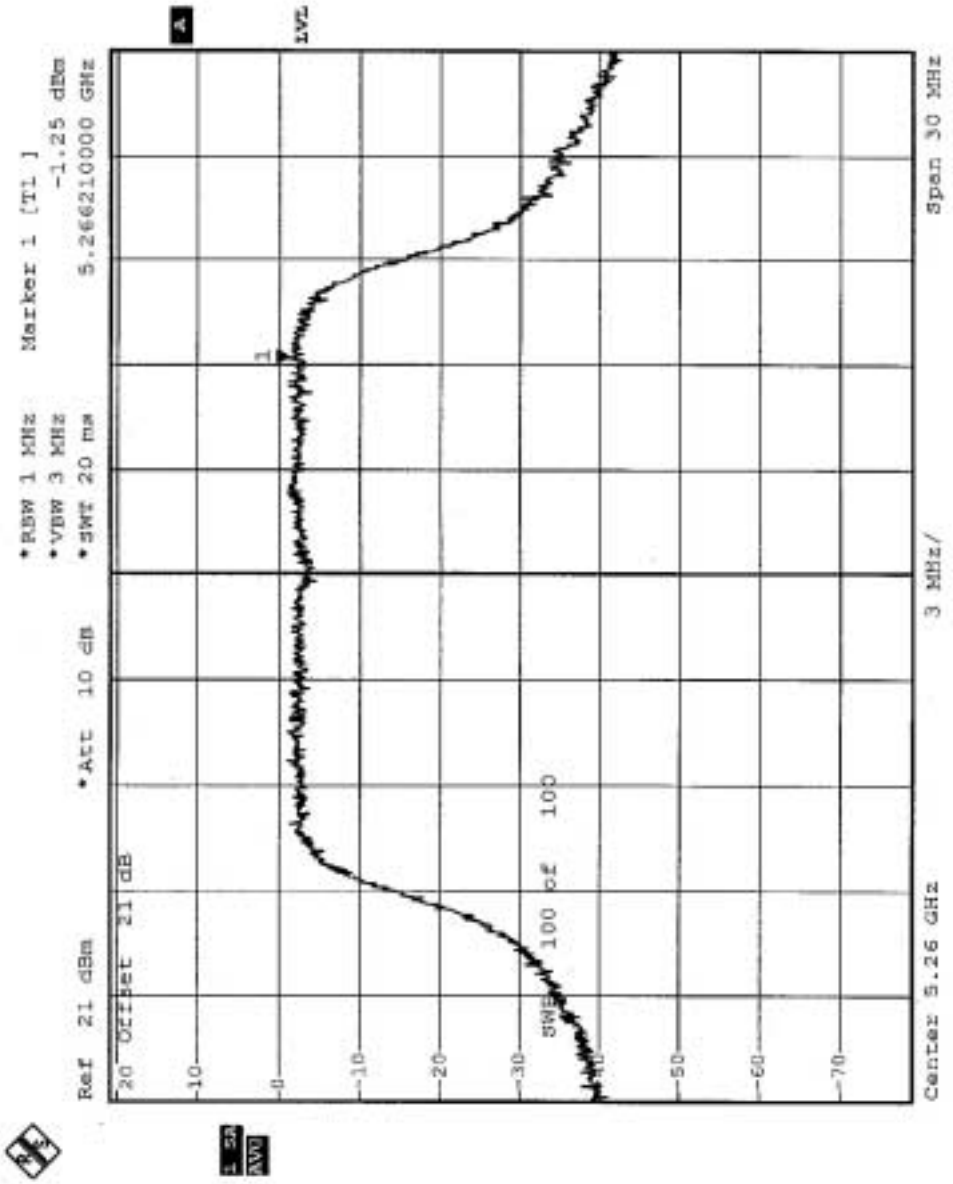
CHANNEL 1


Ref 21 dBm
Offset 21 dB
*Att 10 dB
*RBW 1 MHz
*VBW 3 MHz
*SWT 20 ms
Marker 1 [T1 ]
-0.97 dBm
5.182160000 GHz
Center 5.18 GHz
3 MHz/
Span 30 MHz
SWP 100 of 100
LVL
1 SA
AVG

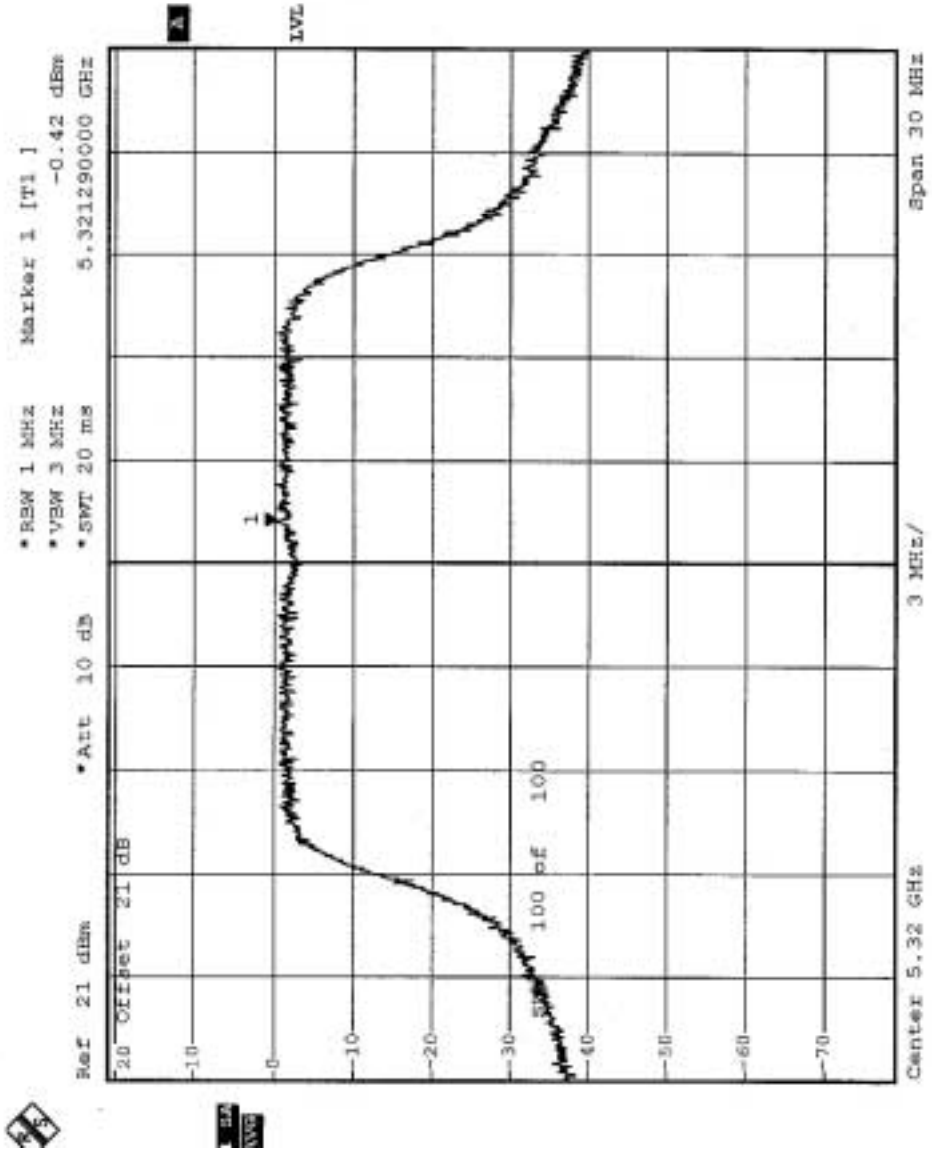
CHANNEL 4


Ref 21 dBm
Offset 21 dB
*Att 10 dB
*RBW 1 MHz
*VBW 3 MHz
*SWT 20 ms
Marker 1 [T1 ]
-1.92 dBm
5.238770000 GHz
A
LVL
SWT 100 µs 100
Center 5.24 GHz
3 MHz/
Span 30 MHz

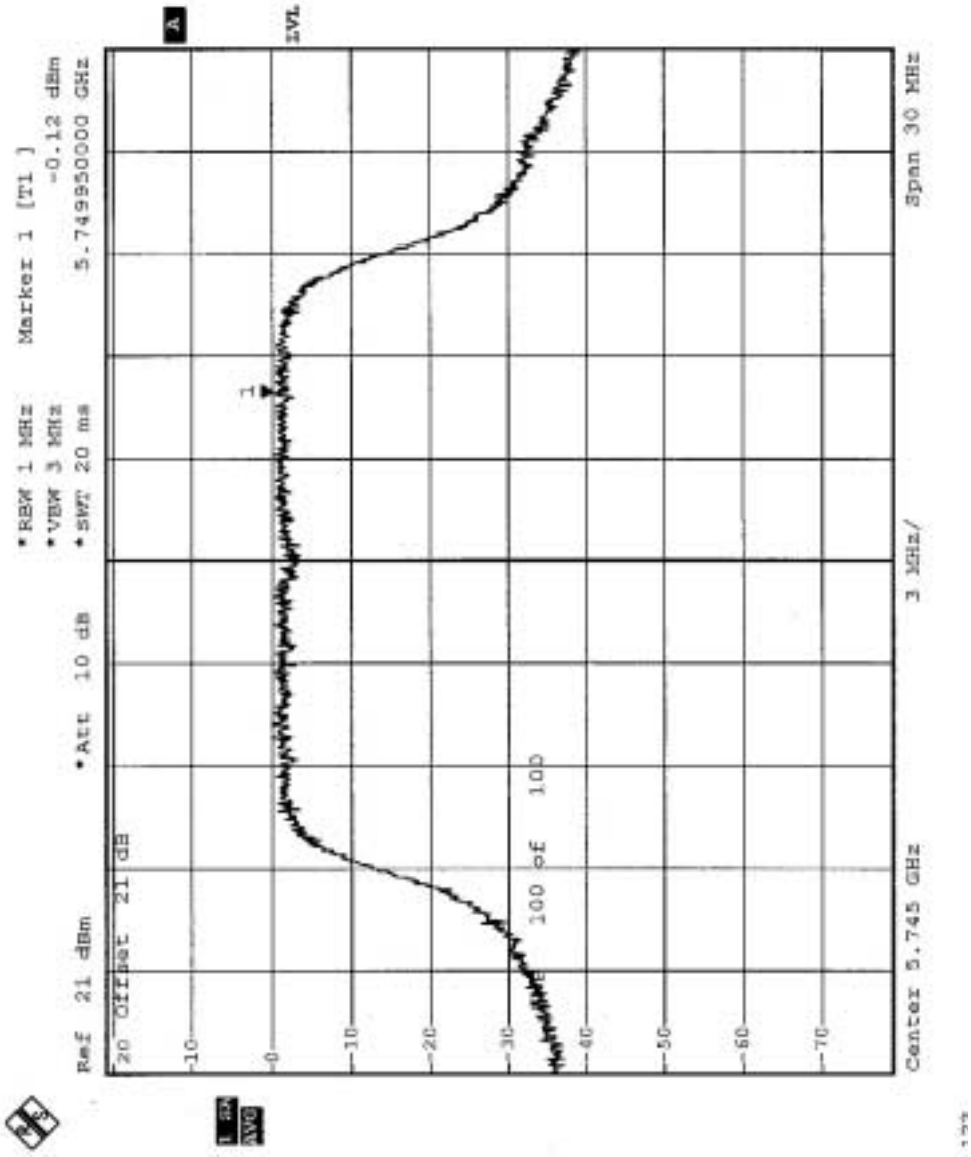
CHANNEL 5


Ref 21 dBm
Offset 21 dB
*Att 10 dB
*RBW 1 MHz
*VBW 3 MHz
*SWT 20 ms
Marker 1 [T1 ]
-1.25 dBm
5.266210000 GHz
SWP 100 of 100
Center 5.26 GHz
3 MHz/
Span 30 MHz

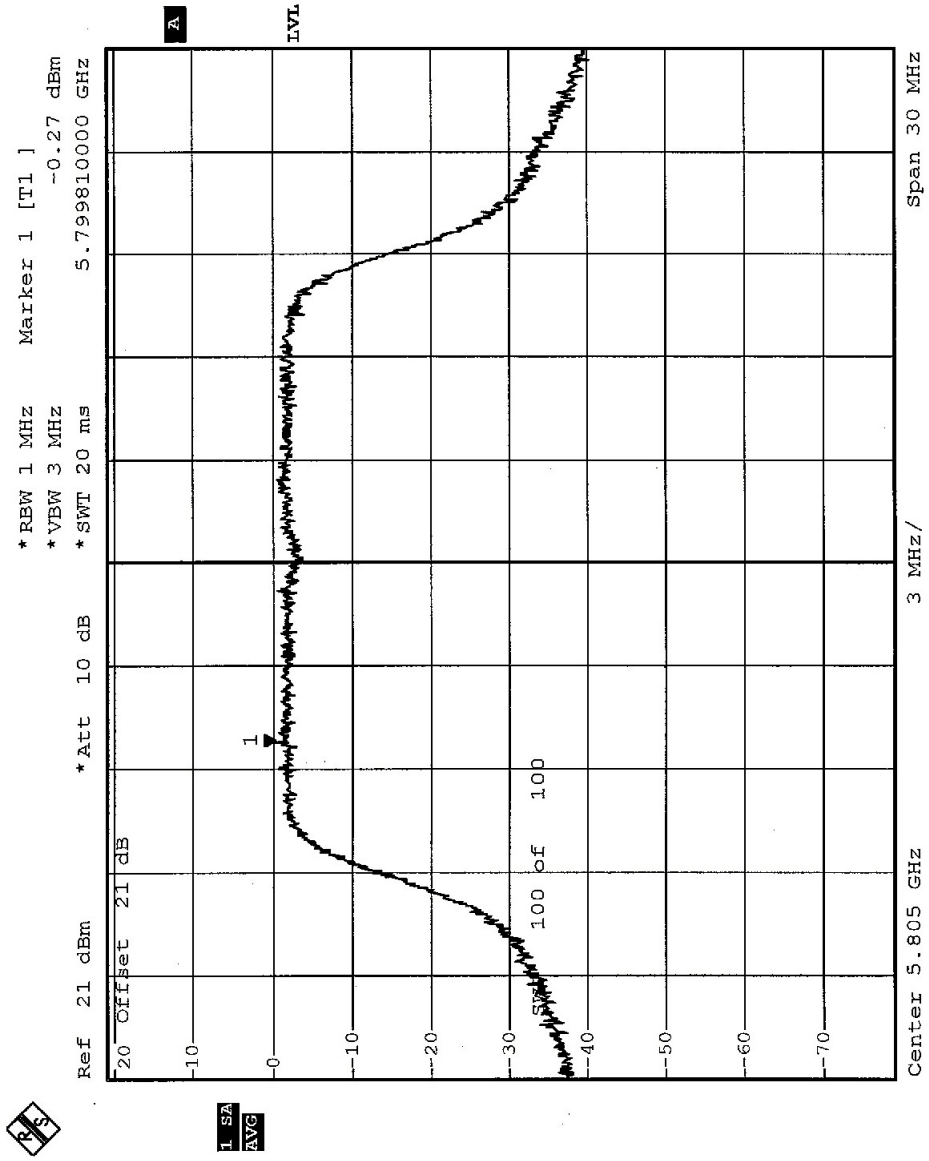
CHANNEL 8


Ref 21 dBm
Offset 21 dB
*Att 10 dB
*RBW 1 MHz
*VBW 3 MHz
*SWT 20 ms
Marker 1 [T1 ]
-0.42 dBm
5.321290000 GHz
LVL
Center 5.32 GHz
3 MHz/
Span 30 MHz
100 of 100

CHANNEL 9


Ref 21 dBm
Offset 21 dB
Att 10 dB
RBW 1 MHz
VBW 3 MHz
SWT 20 ms
Marker 1 [T1 ]
-0.12 dBm
5.749950000 GHz
Center 5.745 GHz
3 MHz/
Span 30 MHz
100 of 100
LVL
A
AVG

CHANNEL 12


Ref 21 dBm
Offset 21 dB
*Att 10 dB
*RBW 1 MHz
*VBW 3 MHz
*SWT 20 ms
Marker 1 [T1 ]
-0.27 dBm
5.799810000 GHz
Center 5.805 GHz
3 MHz/
Span 30 MHz
100 of 100
LVL
1 SA
AVG

## 5.6 FREQUENCY STABILITY

### 5.6.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

The frequency tolerance of the carrier signal shall be maintained within +/- 0.02% of the operating frequency over a temperature variation of –30 degrees to 50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.

### 5.6.2 TEST INSTRUMENTS

| Description & Manufacturer | Model No. | Serial No. | Calibrated Until |
|---|---|---|---|
| R&S SPECTRUM ANALYZER | FSP40 | 100037 | May. 06, 2004 |

**NOTE:**
The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

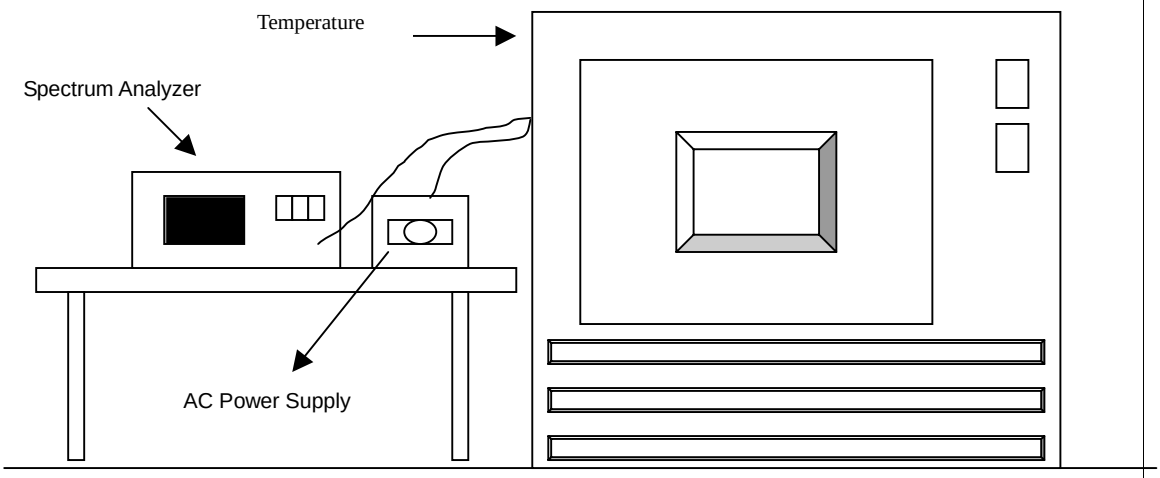
### 5.6.3 TEST PROCEDURE

1. The EUT was placed inside the environmental test chamber and powered by nominal AC voltage.
2. Turn the EUT on and couple its output to a spectrum analyzer.
3. Turn the EUT off and set the chamber to the highest temperature specified.
4. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
5. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
6. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

### 5.6.4 DEVIATION FROM TEST STANDARD

No deviation

## 5.6.5 TEST SETUP




## 5.6.6 EUT OPERATING CONDITION

Same as Item 4.1.6

## 5.6.7 TEST RESULTS

| Operating frequency: 5320MHz | | | | | | Limit : ± 0.02% | |
|---|---|---|---|---|---|---|---|
| Temp. (℃) | Power supply (VAC) | 2 minute | | 5 minute | | 10 minute | |
| | | (MHz) | (%) | (MHz) | (%) | (MHz) | (%) |
| 50 | 126.5 | 5320.0364 | 0.000684 | 5320.0367 | 0.000690 | 5320.0368 | 0.000692 |
| | 110 | 5320.0364 | 0.000684 | 5320.0366 | 0.000688 | 5320.0368 | 0.000692 |
| | 93.5 | 5320.0366 | 0.000688 | 5320.0364 | 0.000684 | 5320.0368 | 0.000692 |
| 40 | 126.5 | 5319.9881 | 0.000224 | 5319.9976 | 0.000045 | 5319.9973 | 0.000051 |
| | 110 | 5319.9882 | 0.000222 | 5319.9976 | 0.000045 | 5319.9975 | 0.000047 |
| | 93.5 | 5319.9981 | 0.000036 | 5319.9979 | 0.000039 | 5319.9972 | 0.000053 |
| 30 | 126.5 | 5319.9922 | 0.000147 | 5319.9919 | 0.000152 | 5319.9917 | 0.000156 |
| | 110 | 5319.9922 | 0.000147 | 5319.9921 | 0.000148 | 5319.9918 | 0.000154 |
| | 93.5 | 5319.9922 | 0.000147 | 5319.9919 | 0.000152 | 5319.9916 | 0.000158 |
| 20 | 126.5 | 5320.0071 | 0.000133 | 5320.0068 | 0.000128 | 5320.0065 | 0.000122 |
| | 110 | 5320.0072 | 0.000135 | 5320.0072 | 0.000135 | 5320.0069 | 0.000130 |
| | 93.5 | 5320.0071 | 0.000133 | 5320.0068 | 0.000128 | 5320.0065 | 0.000122 |
| 10 | 126.5 | 5320.0124 | 0.000233 | 5320.0122 | 0.000229 | 5320.0119 | 0.000224 |
| | 110 | 5320.0124 | 0.000233 | 5320.0122 | 0.000229 | 5320.0121 | 0.000227 |
| | 93.5 | 5320.0124 | 0.000233 | 5320.0121 | 0.000227 | 5320.0118 | 0.000222 |
| 0 | 126.5 | 5320.023 | 0.000432 | 5320.0180 | 0.000338 | 5320.0180 | 0.000338 |
| | 110 | 5320.023 | 0.000432 | 5320.0210 | 0.000395 | 5320.0190 | 0.000357 |
| | 93.5 | 5320.021 | 0.000395 | 5320.0180 | 0.000338 | 5320.0180 | 0.000338 |
| -10 | 126.5 | 5320.0306 | 0.000575 | 5320.0290 | 0.000545 | 5320.0270 | 0.000508 |
| | 110 | 5320.0304 | 0.000571 | 5320.0310 | 0.000583 | 5320.0290 | 0.000545 |
| | 93.5 | 5320.0304 | 0.000571 | 5320.0280 | 0.000526 | 5320.0270 | 0.000508 |
| -20 | 126.5 | 5320.0300 | 0.000564 | 5320.0250 | 0.000470 | 5320.0210 | 0.000395 |
| | 110 | 5320.0300 | 0.000564 | 5320.0280 | 0.000526 | 5320.0240 | 0.000451 |
| | 93.5 | 5320.0300 | 0.000564 | 5320.0240 | 0.000451 | 5320.0220 | 0.000414 |
| -30 | 126.5 | 5320.0116 | 0.000218 | 5320.0111 | 0.000209 | 5320.0108 | 0.000203 |
| | 110 | 5320.0116 | 0.000218 | 5320.0113 | 0.000212 | 5320.0111 | 0.000209 |
| | 93.5 | 5320.0116 | 0.000218 | 5320.0111 | 0.000209 | 5320.0108 | 0.000203 |

## 5.7 BAND EDGES MEASUREMENT

### 5.7.1 TEST INSTRUMENTS

| Description & Manufacturer | Model No. | Serial No. | Calibrated Until |
|---|---|---|---|
| R&S SPECTRUM ANALYZER | FSP40 | 100037 | May. 06, 2004 |

**NOTE:**

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

### 5.7.2 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer via a low lose cable. Set RBW of spectrum analyzer to 1MHz and VBW of spectrum analyzer to 300Hz with suitable frequency span including 100 MHz bandwidth from band edge. The band edges was measured and recorded.

### 5.7.3 EUT OPERATING CONDITION

The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.

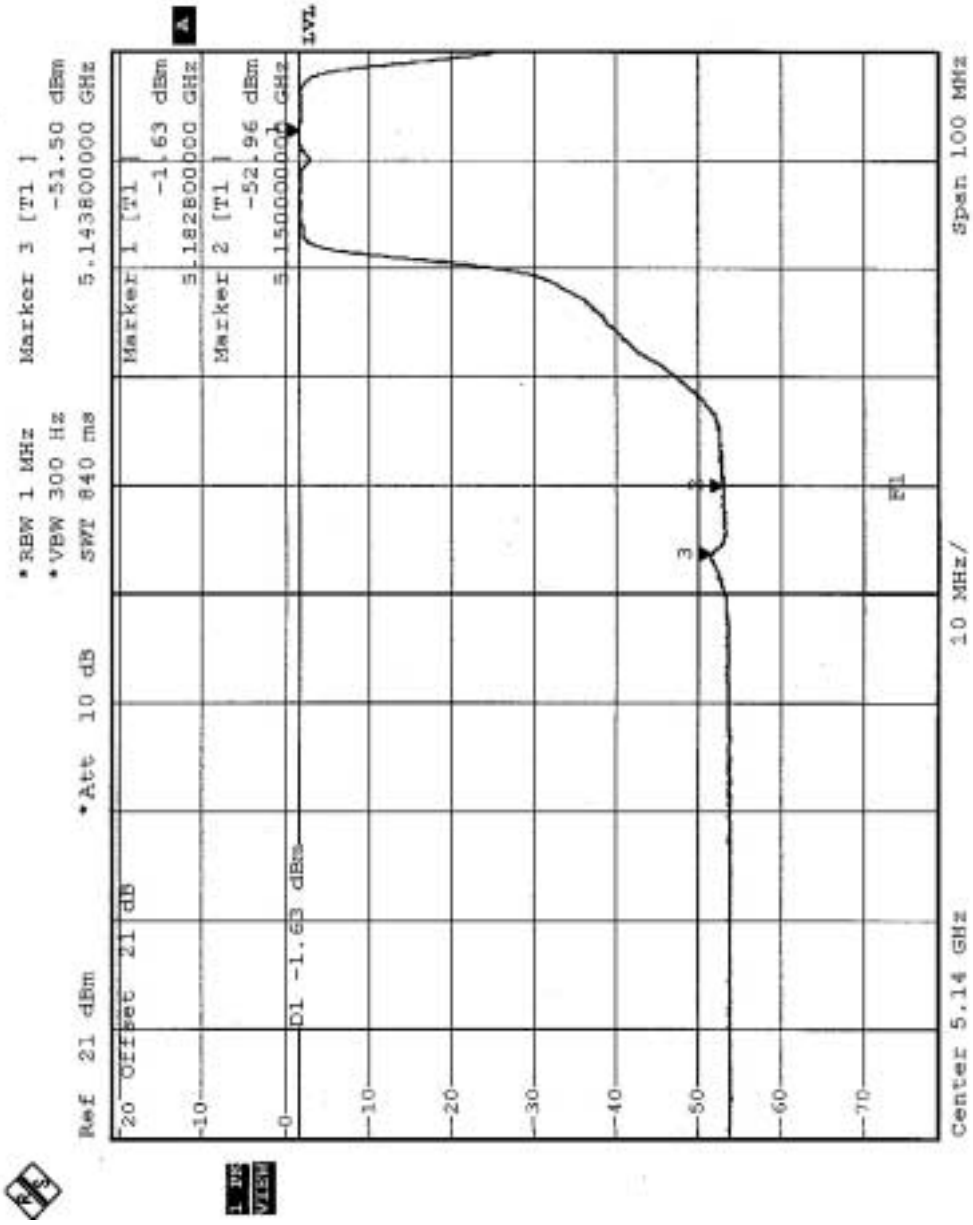
### 5.7.4 TEST RESULTS

For signals in the restricted bands above and below the 5.15 to 5.35 GHz allocated band a measurement was made of the amplitude of the spurious emissions with respect to the intentional signals. The relative amplitude, in dBc, was applied to the average and peak filed strength of the intentional signal made on the OATS to calculate the field strength of the unintentional signals.

The spectrum plots (Average RBW=1MHz, VBW=300Hz) are attached on the following 2 pages.

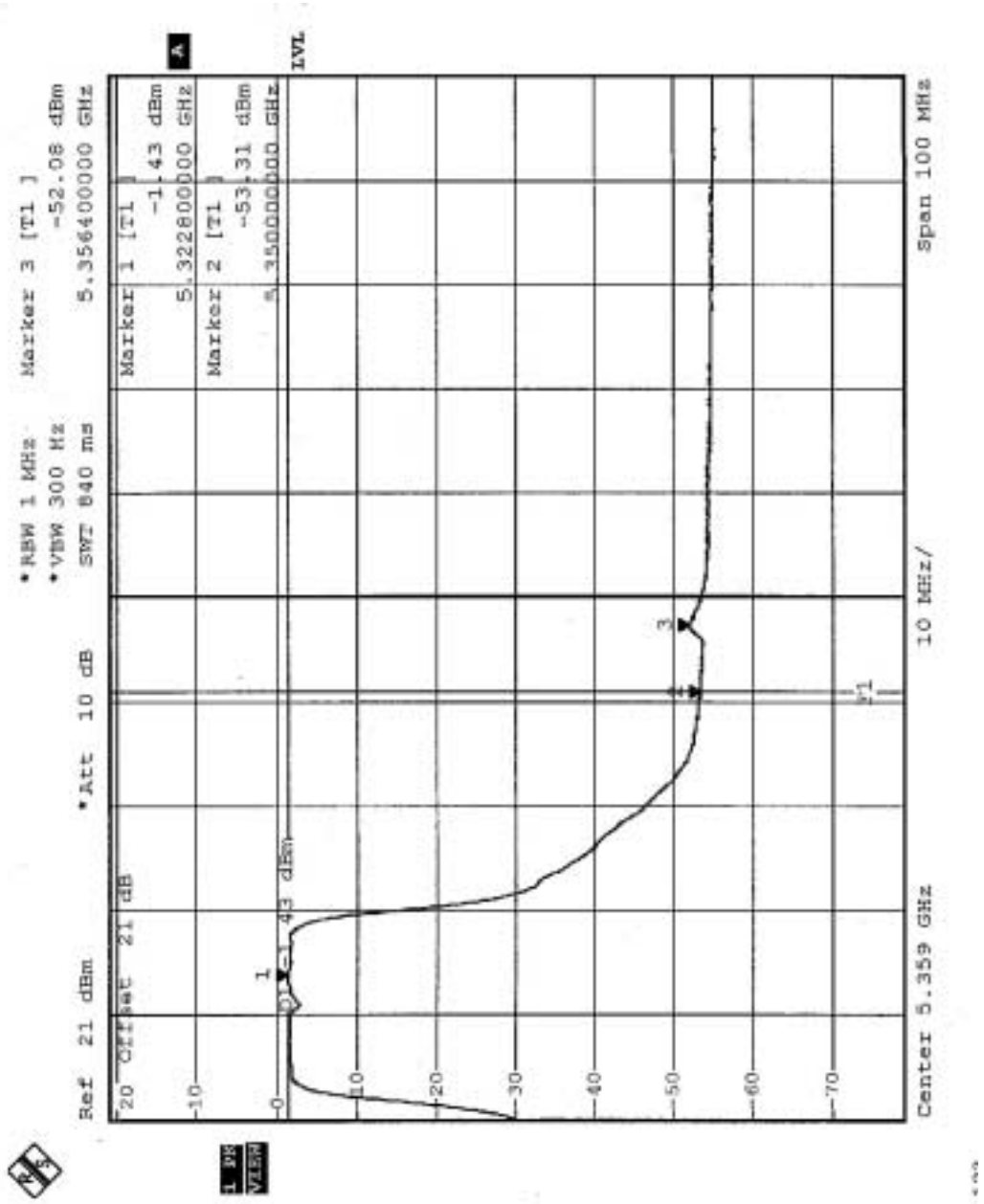
## Normal Mode: Channel 1 (5180 MHz)

The band edge emission plot on the following page shows 51.33dBc (Average) between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 1 (normal mode) is 93.9dBuV/m, so the maximum field strength in restrict band is 93.9-51.33=42.57dBuV/m which is under 54dBuV/m limit.



## Normal Mode: Channel 8 (5320 MHz)

The band edge emission plot on the following page shows 51.88dBc (Average) between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 8 (normal mode) is 97.0dBuV/m, so the maximum field strength in restrict band is 97.0-51.88=45.12dBuV/m which is under 54dBuV/m limit.



## 5.8 ANTENNA REQUIREMENT

### 5.8.1 STANDARD APPLICABLE

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.407(a), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

### 5.8.2 ANTENNA CONNECTED CONSTRUCTION

The antenna used in this product is Integral Dipole antenna with 5ft cable without connector. The maximum Gain of the antenna is 0dBi.

# 6. PHOTOGRAPHS OF THE TEST CONFIGURATION

## CONDUCTED EMISSION TEST

RADIATED EMISSION TEST

# 7. INFORMATION ON THE TESTING LABORATORIES

We, ADT Corp., were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025, Guide 25 or EN 45001:

| | |
|---|---|
| **USA** | FCC, NVLAP, UL |
| **Germany** | TUV Rheinland |
| **Japan** | VCCI |
| **Norway** | NEMKO |
| **Canada** | INDUSTRY CANADA , CSA |
| **R.O.C.** | CNLA, BSMI, DGT |
| **Netherlands** | Telefication |
| **Singapore** | PSB , GOST-ASIA(MOU) |
| **Russia** | CERTIS(MOU) |

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site: www.adt.com.tw/index.5/phtml. If you have any comments, please feel free to contact us at the following:

**Linko EMC/RF Lab**:
Tel: 886-2-26052180
Fax: 886-2-26052943

**Hsin Chu EMC/RF Lab**:
Tel: 886-3-5935343
Fax: 886-3-5935342

**Hwa Ya EMC/RF/Safety Lab**:
Tel: 886-3-3183232
Fax: 886-3-3185050

**Linko RF & Telecom Lab.**
Tel: 886-3-3270910
Fax: 886-3-3270892

**Email**: service@mail.adt.com.tw
**Web Site**: www.adt.com.tw

The address and road map of all our labs can be found in our web site also.